MAR 27 2000
0629-E-09
I 53.59: C 26/V.1/DRAFT

U.S. Department of the Interior
Bureau of Land Management

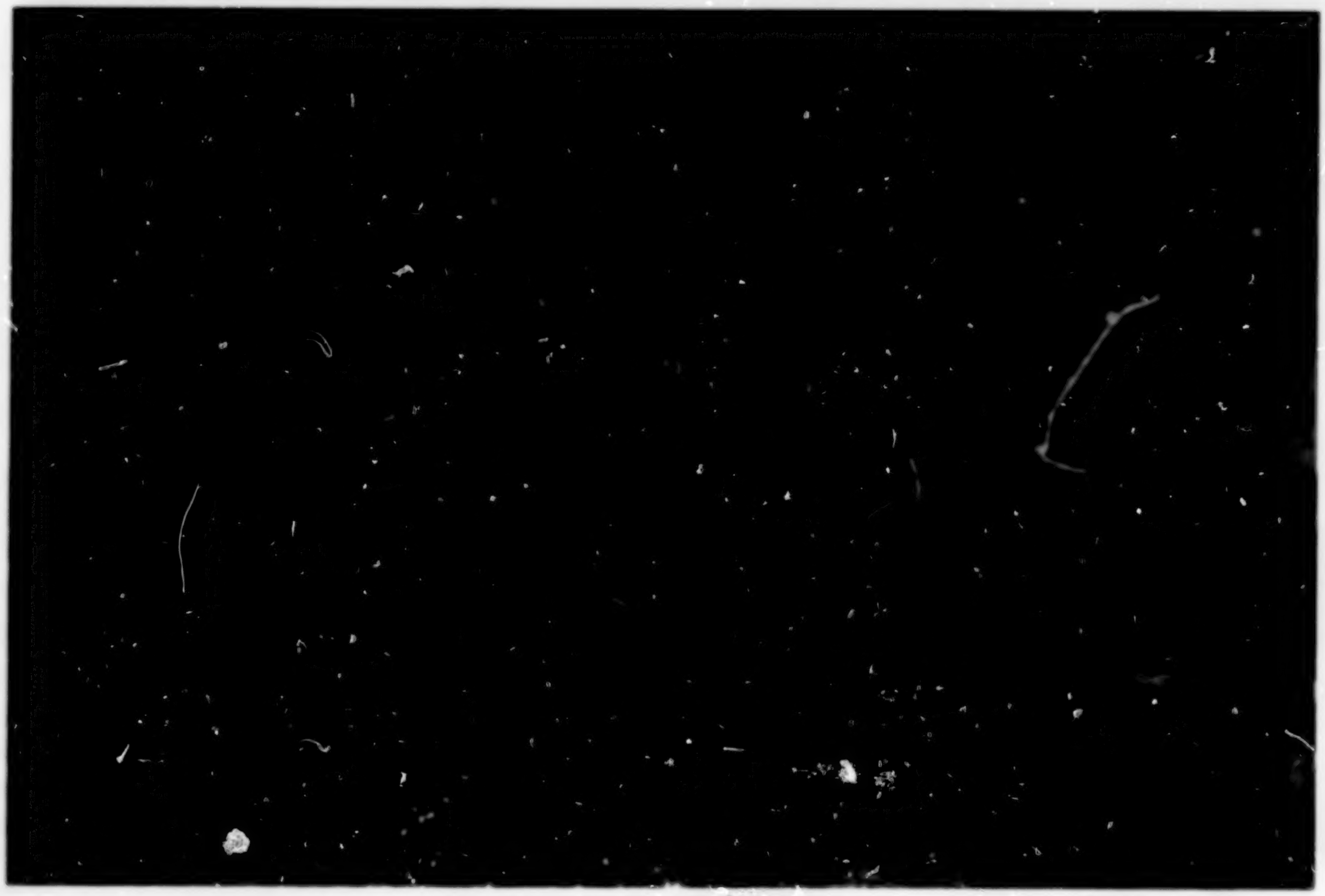
Medford District Office
3040 Biddle Road
Medford, Oregon 97504

March 2000

Cascade Siskiyou Ecological Emphasis Area

Draft Management Plan/ Environmental Impact Statement

Volume I



2000-018973/NF

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

BLM/OR/WA/PL-00/0017+1792

I

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
MEDFORD DISTRICT OFFICE
3040 BIDDLE ROAD
MEDFORD, OREGON 97504

IN REPLY REFER TO:
1793 (116)
CSEEA Plan/EIS
A3690(WHY:cn)

Dear Reader:

This Draft Management Plan/Draft Environmental Impact Statement (DMP/DEIS) for the Cascade Siskiyou Ecological Emphasis Area (CSEEA) analyzes alternatives for long term management of the area. We have made every effort to disclose and discuss important perspectives on the environmental impacts of the alternatives including the preferred alternative. In the 1995 Medford District-wide Resource Management Plan (RMP), we identified CSEEA as a Special Area Land Use Allocation. The RMP indicated that a site-specific management plan for CSEEA was needed to address issues unique to this controversial area. The attached draft plan was developed in coordination with the Redding California Bureau of Land Management (BLM) Field Office.

We welcome your comments on the content of this document. We are particularly interested in comments that address one or more of the following: (1) new information that would affect the analysis, (2) possible improvements in the analysis; and (3) suggestions for improving or clarifying the proposed management direction. Specific comments are the most useful. Comments, including names and addresses, will be available for public review. Individual respondents may request confidentiality. If you wish to withhold your name and/or address from public review or from disclosure under the Freedom of Information Act, you must state this prominently at the beginning of your written comment. Such requests will be honored to the extent allowed by law. All submissions from organizations or businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses, will be made available for public inspection in their entirety. BLM will respond to comments addressing the adequacy of the DMP/DEIS in the Proposed Management Plan/ Final Environmental Impact Statement. This DEIS and your comments will be published on the Medford District web site, www.or.blm.gov/Medford/, under "Planning Documents."

There are five resource management alternatives, each with a different emphasis. Public comment was considered in developing and analyzing issues and alternatives in this document. Also considered was information supplied by local governments, known interest groups and data developed by Bureau staff. The alternatives were designed to resolve, in different ways, the land and resource management issues identified in the early stages of the planning process. Although this is an *administrative* environmental impact statement, there is also the potential that the information and analyses contained in this document could be used for *legislative* action for the CSEEA area. In order to be considered in the Proposed Management Plan/Final Environmental Impact Statement, comments must be received within 90 days of the *Federal Register* notice of availability. **Written comments will be accepted until June 14, 2000.**

BLM will discuss the various management alternatives and answer your questions in a public meeting on Saturday, April 8, 2000 at 1:30 p.m. in Stevenson Student Union, Southern Oregon University, 1250 Siskiyou Boulevard, Ashland, Oregon. If there is sufficient public interest, additional meetings can be arranged. All meetings will be published on the Medford District web site, www.or.blm.gov/Medford/, under "Planning Documents." and in the Medford, Ashland, and Yreka newspapers.

Please keep this copy of the DEIS, as you may wish to refer to it when you review the final document.

All written comments should be sent to:

Tom Sensenig, BLM CSEEA Team Leader
3040 Biddle Road
Medford, OR 97504

or comments may be e-mailed to Tom_Sensenig@or.blm.gov.

Sincerely,

Richard J. Drehobl

Richard J. Drehobl
Field Manager
Ashland Resource Area

Sincerely,

Ron Wenker

Ron Wenker
District Manager
Medford District

U.S. Department of the Interior
Bureau of Land Management

Draft Management Plan and Environmental Statement for the Cascade Siskiyou Ecological Emphasis Area

Prepared by
Medford District Office
March 2000

Elaine Y. Zielinski
State Director, Oregon/Washington

Ron Wenker
District Manager, Medford District

Richard J. Drehobl
Field Manager, Ashland RA

CASCADE SISKIYOU ECOLOGICAL EMPHASIS AREA MANAGEMENT PLAN and ENVIRONMENTAL IMPACT STATEMENT

(X) Draft Environmental Statement ( ) Final Environmental Statement

Department of the Interior, Bureau of Land Management

Type of Action: (X) Administrative ( ) Legislative

Abstract: This Draft Management Plan/Draft Environmental Impact Statement describes and analyzes the impacts of five alternatives for managing the public lands within the Cascade Siskiyou Ecological Emphasis Area (CSEEA). The alternatives provide objectives and recommendations to protect and manage CSEEA resources. Alternative C is BLM's preferred alternative.

Comments: Comments on this document are requested from all interested and/or affected agencies, organizations, and individuals. Comments must be received within 90 days of the Federal Register notice of availability. Written comments will be accepted until June 14, 2000.

For further information contact:

Mr. Tom Sensenig, Team Leader
Bureau of Land Management, Medford District
3040 Biddle Road
Medford, OR 97504
541-618-2200

√

User's Guide

The Cascade Siskiyou Ecological Emphasis Area Draft Management Plan and Draft Environmental Impact Statement is divided into two volumes. Volume I includes a summary, five chapters, glossary, references, and an index. Volume II includes maps and appendices. Also included is a large map of the analysis area.

The Summary is a synopsis of the Draft Management Plan and Draft Environmental Impact Statement (DEIS). Tables that briefly compare the respective alternatives and summarize the effects of the alternatives to the resources, processes and users are found within the summary.

Chapter 1 (Purpose and Need) contains introductory material for the Draft Management Plan/DEIS. It describes the purpose and need for the preparation of the document and potential identifies the issues that will be addressed. It also describes the planning and scoping process and outlines the planning criteria.

Chapter 2 (Affected Environment) describes the environment that could be affected or impacted by implementing any of the alternatives. It includes a description of the environmental processes, resources and major uses related to the issues. Tables are found throughout the chapter.

Chapter 3 (Description of the Alternatives) is divided into the following sections: Introduction, Alternative A (No Action), Alternative B, Alternative C (Preferred), Alternative D, Alternative E, Management Common to All Alternatives, and Alternatives Considered But Eliminated From Detailed Analysis. Alternatives B, C, D and E describe various ways activities would be managed in the CSEEA. Each alternative has a different emphasis, primarily defined in terms of resource focus, with the underlying premise to maintain, protect, restore or enhance relevant and important ecological and biological value(s). Tables that summarize the management activities of the proposed alternatives are found throughout the chapter.

Chapter 4 (Environmental Consequences) describes potential impacts and changes to the CSEEA environment with the implementation of each of the alternatives. Tables summarizing effects to the resources, process or users are found throughout the chapter.

Chapter 5 (Consultation and Coordination) includes a summarization of public involvement, lists agencies and organizations receiving the document, and provides a List of Preparers for the Draft Management Plan/DEIS.

The Glossary, References and Index provide an aid to the reader in finding and understanding the material contained in this document.

The Maps and Appendices in Volume II contains additional information to aid the reader in understanding the document. The large map provides a more detailed look at the analysis area and can be used to locate specific points of interest mentioned in the text such as road numbers.

Abbreviations and Acronyms

ACEC	Area of Critical Environmental Concern
ACS	Aquatic Conservation Strategy
BLM	Bureau of Land Management
BPM	Best Management Practice
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CRWQCB	California Regional Water Quality Control Board
CSEEA	Cascade Siskiyou Ecological Emphasis Area
CWA	Clean Water Act
DEIS	Draft Environmental Impact Statement
DOI	Department of Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FHR	Forest Health Reserves
FLPMA	Federal Land Policy and Management Act
FSEIS	Final Supplemental Environmental Impact Statement
GIS	Geographic Information System
HMP	Habitat Management Plan
IMP	Interim Management Policy
JCWAA	Jenny Creek Watershed Assessment and Analysis
KIGWA	Klamath-Irongate Watershed Analysis
LSR	Late Successional Reserve
LSRA	Late Successional Reserve Assessment
MDO	Medford District Office
MMBF	Million Board Feet
NEPA	National Environmental Protection Act
NHPA	National Historic Preservation Act
NPS	National Park Service
NRCS	Natural Resource Conservation Service
NWFP	Northwest Forest Plan
O&C	Oregon and California Railroad Company Revested Lands
ODEQ	Oregon Department of Environmental Quality
ODFW	Oregon Department of Fish and Wildlife
OHV	Off Highway Vehicle
ONHP	Oregon Natural Heritage Program
OWRD	Oregon Water Resources Department
PSQ	Probable Sale Quantity
REO	Regional Ecosystem Office
RMP	Resource Management Plan
RNA	Research Natural Area
ROD	Record of Decision
SCS	Soil Conservation Service
SSS	Special Status Species
SVIM	Soil-Vegetation Inventory Monitoring
SWA	Site Write-up Area
TMDLs	Total Maximum Daily Loads
UBCWA	Upper Bear Creek Watershed Analysis
USFWS	United States Fish and Wildlife Service
USGS	United States Geologic Service
WHR	Wildlife Habitat Relationships
WQMP	Water Quality Management Plan
WSA	Wilderness Study Area

Table of Contents

Summary

Introduction iii
Issues iii
Alternatives iii
- Alternative A (No Action) iv
- Alternative B iv
- Alternative C iv
- Alternative D iv
- Alternative E v

Management Common to All Alternatives v
Environmental Consequences xix
- Analysis Assumptions and Guidelines xix
- Summary of the Environmental Consequences xix

Tables - Summary

Table S-1. Comparison of Land Ownership in Proposed CSEEA Alternatives vi
Table S-2. Important Information concerning Proposed Alternatives vi
Table S-3. Comparison of the Alternatives in the ACECs vii
Table S-4. Comparison of the Alternatives in the RNAs ix
Table S-5. Comparison of the Alternatives in the Matrix xii
Table S-6. Comparison of the Alternatives in the Jenny Creek LSR xiv
Table S-7. Comparison of the Alternatives in the Box-O Ranch xvii
Table S-8. Trends toward Desired Condition for Ecosystem Health xx
Table S-9. Potential for Adverse Effects to Cultural Resource xx
Table S-10. Adverse Effects on Soils as a result of Alternatives xx
Table S-11. Cumulative Effects on Hydrology xxi
Table S-12. Summary of Effects to Fish and Aquatic Ecosystems xxi
Table S-13. Summarizes the Overall Effects of Proposed Alternatives on Special Status and Special Interest Species xxii
Table S-14. Trend towards desired condition for Plant Community xxiv
Table S-15. Effects to Special Status Plants and Associated Habit xxiv
Table S-16. Effects of Alternatives to Weed Establishment and Spread xxiv
Table S-17. Potential Changes to the Transportation System xxiv
Table S-18. Trends of that Affect Forest Health xxv
Table S-19. Summary of Effects of Alternative on Timber Harvest xxv
Table S-20. Summary Comparison of Effects of Alternatives on Fire xxv
Table S-21. Effects of Alternatives on Rangeland Resources xxvi
Table S-22. Effects of Alternatives on Recreation xxvi
Table S-23. Negative Effects of Alternatives on Land Use Allocations xxvi
Table S-24. A Comparison of Social and Economic Effects of Alternatives xxvii

Chapter 1 - Purpose and Need

Introduction 3
Relationship of the DEIS to BLM Policies, Programs, and Other Plans 4
Planning Process 4
Scoping Process 5
Issues 5
- Grazing 5
- Roads 5
- Timber Harvesting 6
- Mining 6

  - Fragmentation 6
  - Unique Natural and Biological Values 6
  - Fire 6
  - Capacity to Manage as a Protected Area 6
  - Big Government 6
  - Hiking and Non-motorized Recreation 6
  - Pacific Crest National Scenic Trail 7
  - Combining California and Oregon Jurisdictions 7
- Other Issues 7
  - Management Common to all Alternatives 7
  - Issues, Actions and Alternatives Considered but Eliminated 7
- Development of Management Strategies and Alternatives 8
- Summary of Planning Criteria and Considerations 8
  - Federal Land Policy and Management and National Environmental Policy Acts 8
  - Planning Criteria 9
- Significant Decisions Proposed in the Plan 9
- What's next in the Planning Process 10

Chapter 2 – Affected Environment

- Land Ownership 13
- Ecological Processes and Landscape Health 13
  - Landscape Criteria 14
- Cultural Resources 16
  - Historic Use 16
  - Archaeological Sites 19
- Geology 20
- Soils 22
  - Coarse Woody Debris and Soil Health 23
- Hydrology 24
  - Water Quality 27
  - Water Temperature 27
  - Dissolved oxygen 29
  - Water Bacteria/Pathogens 30
  - Water Turbidity and Sedimentation 30
- Aquatic Resources, Stream Channels, and Riparian Habitat 31
  - Jenny Creek Watershed 31
    - Aquatic Resources 32
    - Stream Chennels 37
    - Riparian Habitat 38
  - Bear Creek Watershed 38
    - Aquatic Resources 38
    - Stream Channels 39
    - Riparian Habitat 40
  - Klamath-Iron Gate Watershed 40
    - Aquatic Resources 40
    - Stream Channel 42
    - Riparian Habitat 43
  - Cottonwood Creek Watershed 43
    - Aquatic Resources 44
    - Stream Channels and Riparian Habitat 44
- Vegetation 45
  - Plant Communities 45
    - Grasslands 46
    - Shrublands 46
    - Woodlands 47
    - Conifer Communities 47

Riparian Vegetation 49
Special Plant Communities 49
Plant Communities defined by Edaphic Conditions 51
Ecological Interactions 53
Special Status Plant Species 55
Survey & Manage Plant Species 56
Introduced Plants 58
Noxious Weeds 59
Forest Health 61
Conifer Forest Disturbance Agents 62
Forest Insects and Disease 61
Winds 64
Animal influences 64
Timber Harvest 64
Fuels 65
Wildfire History 65
Low-Severity Regime 66
Moderate-Severity Regime 66
High-Severity Regime 66
Fire Risk 68
Fire Hazard 68
Fire Suppression 69
Prescribed Fire 69
Wildlife 70
Terrestrial Wildlife 70
Special Status Species 70
Birds 70
Reptiles and Amphibians 77
Mammals 78
Terrestrial Mollusks 79
Special Emphasis Species 79
Transportation System 82
Livestock Grazing 84
Wild Horses 87
Recreation 88
Minerals 88
Authorized Uses 89
Background 89
Existing Authorizations 89
Rights to Sub-lease 89
Other Rights 90
Social and Economics 90
Introduction: Defining the Affected Area 90
The Greensprings/Pinehurst Community 91
History 91
Current Conditions 92
Social Institutions 94
The Greensprings Economy 94
Community Interests 95
Summary of the Greensprings/Pinehurst Community 96
A Social and Economic Profile of Jackson County 96
The Economic Structure of Jackson County 97
A Summary of Key Economic Sectors Affected by CSEEA Decisions 98
Timber 98
Agriculture 100
Recreation and Tourism 101
Other Sectors 102

A Summary of Social and Economic Trends 102
Environmental Justice 103
Conclusions 103
Existing Condition of Designated Land Use Areas 104
Matrix Land 104
Timber 105
Special Forest Products 105
Access 105
Harvest Systems 105
Current Stand Conditions 105
Current and Potential Spotted Owl Habitat within the Matrix 106
Jenny Creek Late-Successional Reserve 107
Assessment of Jenny Creek Late-Successional Reserve 107
Objectives that will guide the process for development and application of LSR treatments. 108
Timber 109
Scotch Creek Research Natural Area 110
Establishment 110
RMP Management Restrictions 110
Topography 110
Geology 111
Soils 111
Hydrology 111
Vegetation 112
Riparian Community Types 113
Garry Oak Woodland Type 113
Rock Outcrops 114
Grassland Types 114
Chaparral Types 115
Conifer Types 118
Alien Plants 118
Special Plants 119
Animals 119
Mollusks 120
Aquatic Insects 120
Terrestrial Insects 120
Amphibians 120
Fish 120
Birds 120
Grazing 121
Transportation 121
Recreation 121
Oregon Gulch Research Natural Area 121
Establishment 121
RMP Management Restrictions 122
Geology 122
Soils 123
Hydrology 123
Vegetation 124
Alien plants 126
Special plants 126
Forest Health 126
Animals 126
Mollusks 127
Insects 127
Amphibians 127
Fish 127
Birds 127

Grazing 128
Transportation 128
Recreation 128
Jenny Creek Area of Critical Environmental Concern 128
Establishment 129
RMP Management Restrictions 129
Geology 129
Soils 129
Vegetation 129
Alien Aquatic Plants 130
Alien Terrestrial Plants 130
Aquatic Animals 130
Introduced organisms – Fish 131
Introduced organisms – Amphibians 131
Wildlife 131
Introduced organisms – Animals 131
Hydrology 131
Recreation 132
Transportation 132
Pilot Rock Area of Critical Environmental Concern 132
Establishment 133
RMP Management Restrictions 133
Topography 133
Geology 134
Soils 135
Hydrology 136
Vegetation 138
Grassland 139
Alien Plants and Noxious Weeds 140
Special Plants 140
Animals 141
Butterflies 141
Birds 141
Bats 141
Fish 142
Amphibians 142
Mammals 142
Grazing 142
Transportation 143
Recreation 144
Pacific Crest National Scenic Trail 144
Spur Trail To Pilot Rock 144
Base Trail 144
Facilities 145
Soda Mountain Wilderness Study Area 145
Vegetation 145
Geology 146
Mineral Resources 146
Livestock Management (Grazing) 146
Wildlife 146
Recreation 147
Box-O Ranch 147
Access 148
Climate 148
Stream Channels 148
Water Quantity 150
Water Quality 151

Existing Condition in Relation to Aquatic Conservation Strategy Objectives 152
Riparian and Aquatic Vegetation 152
Fish and Aquatic Wildlife 153
Soils 154
Minerals 155
Plant Communities 155
Special Status Plants 157
Fire History 157
Biological Diversity/Ecosystem Health 158
Wildlife 159
Other Wildlife, including Special Status Species 161
Wild Horses 162
Livestock Forage 162
Irrigation System/Water Rights 163
Bottomland Pastures 164
Livestock Grazing 164
    Fencing/Livestock Handling Facilities 165
Noxious weeds 165
Cultural Resources 165
Recreation 165
Transportation 166
Ranch Buildings, Facilities and Equipment 166
Social and Economic Issues 167

Tables - Chapter 2

Table 2-1. Percentage Acute Disturbance for Plant Communities within Analysis Area 16
Table 2-2. Coarse Woody Debris Observations and Targets by Ecoregion in CSEEA 24
Table 2-3. Hydrologic Units within the CSEEA 25
Table 2-4. Water Quality Limited Streams on the 303(d) List 28
Table 2-5. Water bodies included in DEQ's NPS Assessment 29
Table 2-6. Probable Causes and Land Use Associated with Nonpoint Source Pollution 29
Table 2-7. Major Plant Communities on Public Lands within the CSEEA 45
Table 2-9. Trends toward Desired Condition for Springs, Seeps, Semi-wetlands, Wetlands and High Elevation Meadows 53
Table 2-10. Special Status Plants Found within the CSEEA 57
Table 2-11. Survey and Manage Plants Found within the proposed CSEEA 58
Table 2-12. Noxious Weeds in the CSEEA 60
Table 2-13. General Vegetation Stand Types in the CSEEA 61
Table 2-14. Estimated Gross Timber Volumes in proposed CSEEA 65
Table 2-15. Fire Regimes in Special Management Areas within the proposed CSEEA 67
Table 2-16. Fire Hazard Ratings for the proposed CSEEA 69
Table 2-17. Current habitat amounts (in acres) in the proposed CSEEA 73
Table 2-18. Distance and Direction to nearest LSRs from Jenny Creek LSR 75
Table 2-19. Special Status Terrestrial Mollusks known or suspected in the Special Emphasis Species 80
Table 2-20. BLM Grazing Allotments within the proposed CSEEA 85
Table 2-21. Developed Properties in CSEEA Area 93
Table 2-22. Timber Harvest in Jackson County For Selected Years Thousands of Board Feet 99
Table 2-23. General Plant Communities in the Matrix 104
Table 2-24. Current Stand Conditions in the Matrix 106
Table 2-25. Current and Potential Spotted Owl Habitat in Matrix Lands of CSEEA 107
Table 2-26. Current and Potential Spotted Owl Habitat in LSR Lands of CSEEA 108
Table 2-27. General Plant Communities in the Jenny Creek LSR 109
Table 2-28. Current Stand Conditions in the Jenny Creek LSR 109
Table 2-29. Scotch Creek RNA Soil Units 111
Table 2-30. Scotch Creek RNA Special Status Plants 119
Table 2-31. Oregon Gulch RNA Soil Units 123
Table 2-32. Pilot Rock ACEC, Pilot Rock Unit Soils 135

Table 2-33. Pilot Rock ACEC , Mariposa Unit Soils 136
Table 2-34. Springs and Ponds near the Pilot Rock ACEC Unit 137

Chapter 3 – Alternatives

Oregon BLM Land Within the CSEEA Boundary of Consideration 171
  Rationale for the Preferred Alternative 173
Alternative A – (No Action) 174
  Boundary Adjustments 174
  Grazing 174
  Timber 174
  Transportation 174
  Off -Highway Vehicle Use 175
  Hiking and Non-Motorized Recreation 175
  Forest Health 175
  Grass /Shrub/Woodland Community Health and Restoration 175
  Private Land Acquisitions 176
  Special Forest Products 176
  Horse/Pack Stock Recreation 176
  Minerals 176
  Facilities/Rights-of-Way 176
Alternative B 180
  Boundary Adjustments 180
  Grazing 180
  Timber 180
  Transportation 180
  Off-Highway Vehicle Use 181
  Hiking/Non-Motorized Recreation 181
  Forest Health 181
  Shrub/Grass Community Health and Restoration 181
  Private Land Acquisitions 181
  Special Forest Products 181
  Horse/Pack Stock Recreation 181
  Minerals 181
  Facilities/Rights-of-Way 182
Alternative C 185
  CSEEA Boundary Adjustments 185
    External Boundary 185
    Internal Boundary 185
  Grazing 185
  Timber 189
  Transportation 189
  Off-Highway Vehicles 190
  Hiking and Non-Motorized Recreation 190
  Forest Health 190
  Shrub/Grass Community Health and Restoration 191
  Private Land Acquisitions 191
  Special Forest Products 191
  Horse/Pack Stock Recreation 191
  Minerals 191
  Facilities/Rights-of Way 191
Alternative D 194
  CSEEA Boundary Adjustments 195
    External Boundary 195
    Internal Boundary 195
  Grazing 196
    The Use of Livestock as a Tool to Meet Ecological Objectives 196

- Timber 196
- Transportation 196
  - Pilot Rock ACEC 196
  - Jenny Creek ACEC 197
  - Scotch Creek RNA 197
  - Oregon Gulch RNA 197
  - Soda Mountain Wilderness Study Area 197
  - Jenny Creek Late-Successional Reserve 197
  - Box-O Ranch 197
- Off-Highway Vehicles 197
- Hiking and Non-Motorized Recreation 197
- Forest Health (Trees) 198
- Grass/Shrubs/Woodland Community Health and Restoration 198
- Private Land Acquisition 198
- Special Forest Products 198
- Horse/Pack Stock Recreation 198
- Facilities and Rights-of-Way 198
- Minerals 198

Alternative E 204
- Boundary Adjustments 204
- Grazing 205
- Timber 205
- Transportation 205
- Off-Highway Vehicle 205
- Hiking and Non-Motorized Recreation 205
- Forest Health (trees) 206
- Grass /Shrub/Woodland Community Health and Restoration 206
- Private Land Acquisitions 206
- Special Forest Products 206
- Horse/ Pack Stock Recreation 207
- Minerals 207
- Facilities/Rights-of-Way 207

California BLM Land Within the CSEEA Boundary of Consideration 211
- Alternative A (No Action) 211
- Alternative B 212
- Alternative C 212
- Alternative D 212

Management Common To All Alternatives 214
- Special National Designation 214
- Management of Soda Mountain WSA 214
- Planning Area Ownership 214
- Noxious Weed Control and Management 214
- Management of Fire Suppression Activities 215
- Prescribed Fire Management 215
- Archaeological Site Protection 215
- Special Use Activities 216
  - General Recreation Permit Policy 216
  - General Land Use Authorization Polic 217
- Aquatic Conservation Strategy 218
- Best Management Practices 218
- Management of Fish and Wildlife by the State of Oregon 218
- Pacific Crest National Scenic Trail 218
- Acquired Lands 218
- Special Status Species 218

Issues, Actions and Alternatives Considered But Eliminated From Analysis 219
- Expanding the WSA boundary 219

- Full Recreation Development 219
- Eliminating Prescribed Fire 219
- Irrigating the Pastures on the Box-O Ranch 219

Tables - Chapter 3

Table 3-1. Alternative A 177
Table 3-2. Alternative B 182
Table 3-3. CSEEA Ecological Objectives for Livestock Use 186
Table 3-4. Alternative C 192
Table 3-5. Alternative D 199
Table 3-6. Alternative E 208
Table 3-7. Boundary Alternatives for the California land in the CSEEA 213
Table 3-8. Management of Soda Mountain Wilderness Study Area If Not Designated Wilderness 214

Chapter 4 - Environmental Consequences

- Introduction 223
- Environmental Consequences 223
  - Analysis Assumptions and Guidelines 223
- Ecological Processes and Landscape Health 224
- Cultural Resources 224
  - Potential Effects by Action 224
- Soils 226
- Hydrology 229
  - Water Quality 232
- Aquatic Resources, Stream Channels, and Riparian Habitat 234
  - External Boundary Adjustments 234
  - Internal Boundary Adjustments 234
  - Grazing 235
  - Timber/PSQ 235
  - Transportation 236
  - Off-Highway Vehicle 236
  - Hiking and Non-Motorized Recreation 237
  - Forest Health (trees) 237
  - Grass /Shrub/Woodland Community Health and Restoration 238
  - Private Land Acquisitions 238
  - Special Forest Products 239
  - Horse/ Pack Stock Recreation 239
  - Minerals 239
- Wildlife 239
  - Birds 246
  - Reptiles and Amphibians 247
  - Mammals 248
  - Terrestrial Mollusks 248
  - Special Interest Species 248
- Vegetation 249
  - Grassland, Shrubland, and Woodland Health 249
  - Special Status Plants 249
  - Noxious Weeds and Introduced Plants 251
  - Forest Health 257
- Timber Harvest 259
- Fire 262
  - Wildfire Suppression 262
  - Prescribed Fire 264
- Transportation Systems 264
- Livestock Operations and Forage 265
  - Background Information 265

  - Livestock Grazing ... 267
  - Access ... 267
  - Recreation ... 267
  - Rangeland Improvements ... 267
  - Areas of Critical Environmental Concern ... 268
  - Research Natural Area ... 268
  - Cumulative Impacts ... 268
- Recreational Use ... 270
  - Off-Highway Vehicles ... 270
  - Snowmobile use ... 273
  - Non-Motorized Recreation ... 274
  - Horse and Pack Stock Use ... 274
  - Recreation Developments ... 275
- Land Use Authorizations ... 276
  - Background ... 276
- Social and Economics ... 276
  - The Greensprings Community ... 276
    - Collaboration and consultation ... 276
    - Restoration ... 281
    - Restoration employment ... 281
    - Education ... 281
    - Support of Recreation Business Opportunities ... 281
  - Soda Mountain Wilderness Council ... 281
  - Jackson County ... 282
    - Agriculture ... 282
    - Forest and Wood Products ... 283
    - Recreation ... 284
  - Mitigation Opportunities ... 285
    - Greensprings Community ... 285
    - Agriculture ... 287
    - Forest and Wood Products ... 287
    - Recreation ... 287

Tables - Chapter 4

Table 4-1. Current and Desired Future Conditions for Landscape Criteria ... 225
Table 4-2. Trends toward Desired Condition for Landscape-Level Criteria identified in table 4-1 ... 226
Table 4-3. Potential for Adverse Effects to Cultural Resource ... 227
Table 4-4. Cumulative Effects on Soils as a result of Alternatives ... 229
Table 4-5. Potential Changes to Hydrologic Processes due to Proposed Management Activities ... 230
Table 4-6. Comparison of Alternatives for Potential Adverse Effects on Streamflows ... 231
Table 4-7. Comparison of Alternatives for Cumulative Effects on Streamflows ... 231
Table 4-8. Potential Changes to Water Quality due to Proposed Management Activities ... 233
Table 4-9. Comparison of Alternatives for Potential Adverse Effects on Water Quality ... 233
Table 4-10. Comparison of Alternatives for Cumulative Effects on Water Quality ... 234
Table 4-11. Effects to Wildlife Habitat Parameters ... 240
Table 4-12. Overall Effects of Alternatives on Special Status and Special Interest Species ... 244
Table 4-13. Current and desired future conditions for grassland, shrubland, and woodland community-level criteria ... 250
Table 4-14. Trend towards desired condition for Plant Community criteria identified within table 4-13 ... 251
Table 4-15. Potential Effects to Special Status Plants or Habitats ... 252
Table 4-16. Comparison of Adverse Effects of Special Status Plant and Associated Habitat ... 256
Table 4-17. Cumulative Effects to Special Status Plants and Associated Habit ... 256
Table 4-18. Comparison of Alternatives as they Affect Weeds ... 257
Table 4-20. Relative Trends of Disturbance Agents (effects) in Forest Stands ... 259
Table 4-21. Forest Structural Characteristics and Species Composition(trends) by Alternative ... 260
Table 4-22. Volume by Logging Systems (MBF), Alternatives A and E ... 260
Table 4-23. Volume by Logging Systems (MBF), Alternative B ... 261

Table 4-24. Volume by Logging Systems (MBF), Alternative C. Schoheim Road Blocked at Gate. No aerial yarding beyond 6000 feet 261
Table 4-25. Volume by Logging Systems (MBF), Alternative C. Schoheim Road blocked south of road 41S-2E-3.1 261
Table 4-26. Projected Harvest Volume Available by Alternative 262
Table 4-27. Weighted Average Logging Costs/MBF (stump to truck), First entry Timber Value (price paid to Government), and Contribution to Local Economy from Matrix Timber Harvesting 262
Table 4-28. Key Roads needed for Wildfire Suppression Efforts within the CSEEA 263
Table 4-29. Potential Changes to the Transportation System 265
Table 4-30. Impacts on Livestock Operations and Forage 271
Table 4-31. Cumulative Impacts to Livestock Operations and Forage 272
Table 4-32. Comparison of Effects to Recreational Uses 277
Table 4-33. Land Use Authorization Impacts as a Result of Alternative A (No Action) 279
Table 4-34. Land Use Authorization Impact as a Result of Alternative B 279
Table 4-35. Land Use Authorization Impacts as a Result of Alternative C 280
Table 4-36. Land Use Authorization Impacts as a Result of Alternative D 280
Table 4-37. Land Use Authorization Impacts as a Result of Alternative E 280
Table 4-38. Klamath Falls AUM Multipliers Applied to the CSEEA 283
Table 4-39. Average Number of Workers Per Board Foot in Jackson County, Oregon 283
Table 4-40. Projected Annual Jobs and Payroll Sustained Through Timber Harvesting 284
Table 4-41. A Comparison of Social and Economic Effects of Alternatives 286

Chapter 5 - Consultation and Coordination 291
Summary of Scoping 291
Key Issues and Concerns 292
    Grazing 292
    Roads 292
    Timber Harvesting 293
    Mining 293
    Fragmentation 293
    Unique Natural and Biological Values 294
    Fire 294
    Capacity to Manage as a Protected Area 294
    Big Government 294
    Hiking and Non-motorized Recreation 295
    Pacific Crest National Scenic Trail 295
    Combining California and Oregon Jurisdictions 295
Planning Consistency 295
    Federal Agencies 296
    State Government 296
    Local Government 297
DEIS Distribution List and Availability on the Internet 297
    Elected Officials 297
    Federal Agencies 298
    State and Local Government 298
    American Indian Tribes and Nations 298
    Libraries 298
    Organizations 299
    Individuals 299
List of Preparers 301
Glossary 303
References 315
Index 327

Summary

XIX

XX

Summary

Introduction

The Cascade Siskiyou Ecological Emphasis Area (CSEEA) was established in the 1994 Northwest Forest Plan and the 1995 Medford District Resource Management Plan (RMP) primarily because of its unique, diverse ecological and biological characteristics. The landscape being analyzed for the Cascade Siskiyou Ecological Emphasis Area covers 91,640 acres in Southwest Oregon and Northern California (map 1). The BLM-administered land within the boundary of the proposed CSEEA is approximately 52,407 acres in Oregon and 4,522 acres in California (CSEEA analysis area map 2). This Draft Environmental Impact Statement (DEIS) will address the inclusion of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA, both located in California, as a part of the CSEEA, but will not address management activities within these areas. This plan will address management activities for all Oregon BLM administered land inside the CSEEA boundary.

The guiding principle for management of the CSEEA is to maintain, protect, restore or enhance relevant and important cultural, biological and ecological resource values. All other considerations are secondary to this guidance. The management alternatives presented in this plan are necessarily constrained to those values that require attention. As a result, the range of alternatives presented in this planning document for the CSEEA is narrower in scope than is typical of other BLM management plans.

Issues

The identification of significant issues to be addressed in the plan was the purpose of the scoping process. For planning purposes, an "issue" is defined as a matter of controversy, dispute, or general concern over resource management activities, the environment, or land uses. In essence, issues help determine what decisions will be made in the plan and what the environmental analysis must address. Based on scoping comments received and subsequent analysis and evaluation, major planning issues were identified. Those issues are listed below:

- CSEEA boundary
- Livestock Grazing
- Timber Management
- Transportation System
- Off-Highway Vehicle Use
- Hiking/Non-Motorized Vehicles
- Forest Health
- Grass/Shrubs/Woodland Community Health
- Private Land Acquisitions
- Special Forest Products
- Horse/ Pack Stock Recreation
- Minerals
- Facilities/Rights-of-Way

Alternatives

This Draft CSEEA Management Plan and Draft Environmental Impact Statement describes five alternatives for management of the CSEEA, including a "no action" Alternative A. The four "action" alternatives, Alternatives B, C, D, and E, describe various ways activities would be managed in the CSEEA. Each alternative has a different emphasis, primarily defined in terms of resource focus, with the underlying premise to maintain, protect, restore or enhance relevant and important ecological and biological value(s). A comparison of land ownership in the proposed CSEEA and important information concerning the alternatives is displayed in table S-1 and S-2, respectively. Actions within the proposed alternatives in **bold** print signifies a potential amendment to the Medford District Resource Management Plan (RMP).

Alternative A (No Action)

Following the designation of the Cascade Siskiyou Ecological Emphasis Area (CSEEA) in the RMP, management direction was established pending the completion of a management plan. The No Action Alternative would continue the present management approach, guided by the RMP and existing law and policy. The No Action Alternative is required by the National Environmental Policy Act (NEPA) and provides the baseline against which to compare the other alternatives.

The Alternative A provides a baseline of the current RMP management direction of the designated land use areas within the proposed boundary of the CSEEA. Alternative A would continue this baseline approach. It would also continue current levels of research, maintenance, access and other established uses consistent with the RMP. Activities proposed in this alternative are summarized in tables S-3 through S-7.

Alternative B

This alternative provides the highest sustainable commodity outputs, including forest products, livestock production, special forest products and other commodities while adequately accommodating ecological protection required by existing laws and regulations. In addition, Alternative B fully acknowledges the ecological virtues of the CSEEA and would emphasize them in the planning of management activities. Although historic timber extraction has been relatively low throughout the CSEEA, this alternative recognizes its potential importance as available timber supplies diminish elsewhere. Grazing, which has historically occurred at much higher levels, would continue but would be managed to avoid adverse ecological impacts. Activities proposed in this alternative are summarized in tables S-3 through S-7.

Alternative C

Alternative C places priority on the restoration, maintenance and enhancement of ecological processes. This alternative recognizes the importance of natural disturbance, particularly fire, in the maintenance and restoration of unique plant and animal communities, habitats and biological diversity within the CSEEA. Management activities would be prescribed to maintain or improve the ecological stability of the CSEEA based on knowledge of local ecological relationships and biological processes. Activities proposed in this alternative are summarized in tables S-3 through S-7.

Alternative D

Alternative D emphasizes the maintenance and preservation of the rare and unique ecological processes, conditions, and habitats in the CSEEA with minimum human intervention. Natural processes and events would proceed unhampered with the exception of wildfire or activities required by law, legal restraints, or mandates. Management practices would only be used to prevent the loss of biological and ecological values or for research or scientific purposes that would enhance the objectives of this alternative. Lands that have been previously degraded by commercial timber harvest, livestock impacts, or other human activities would be managed with restoration of natural conditions and processes as the over riding objective. Under this alternative, commodity extraction (timber, livestock forage, minerals, water) would only occur under exceptional circumstances where it can be conclusively shown the activity would be clearly beneficial to the biological and ecological values for which the CSEEA was established. This alternative offers maximum protection for big game winter range. The intent of Alternative D is to allow changing CSEEA ecosystems to be driven by natural processes with little or no human interference or management. Activities proposed in this alternative are summarized in tables S-3 through S-7.

Alternative E

This alternative emphasizes environmentally responsible recreation throughout the planning area. Most BLM administered land in the planning area would be managed for a variety of recreation opportunities consistent with other resource management objectives. Activities proposed in this alternative are summarized in tables S-3 through S-7.

Management Common to All Alternatives

There are several other important issues raised during the scoping process which are of concern to the public, but which have been adequately addressed in the Medford District's RMP, or are governed by existing laws and regulations. Because management of these issues has already been determined, management alternatives for those issues are not presented in this plan. These issues are discussed in further detail in the "Management Common to All Alternatives" section in Chapter 3.

- Management of Noxious Weeds
- Management of the Soda Mountain Wilderness Study Area
- Management of Fire Suppression Activities
- Management of Prescribed Fire
- Management of Archeological Sites
- Management of Special Use Activities
- Management of Riparian Areas consistent with the Aquatic Conservation Strategy
- Management of Fish and Wildlife (including hunting and fishing) by the State of Oregon
- Management of the Pacific Crest National Scenic Trail
- Management of Acquired Lands
- Management of Air Quality
- Management of Special Status Species

XXIII

Table S-1. Comparison of Land Ownership in Proposed CSEEA Alternatives

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Oregon BLM	31,575 acres	**29,159 acres**	**40,975 acres**	**52,407 acres**	31,575 acres
California BLM	4,274 acres	2,744 acres	4,234 acres	4,522 acres	4,274 acres
State of California	4,912 acres	4,685 acres	4,912 acres	4,912 acres	4,912 acres
Bureau of Rec. (Oregon)	0	0	0	4	0
Private	11,893 acres	4,809 acres	17,807 acres	29,795 acres	11,893 acres
Total Land within CSEEA	52,654 acres	**41,397 acres**	**67,928 acres**	**91,640 acres**	52,654 acres

Table S-2. Important Information concerning Proposed Alternatives

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Size of Pilot Rock ACEC	544 acres	544 acres	2,992 acres	2,292 acres	544 acres
Size of Jenny Creek ACEC	481 acres	481 acres	702 acres	1,383 acres	481 acres
Size of Scotch Creek RNA	1,797 acres	1,797 acres	1,797 acres	3,261 acres	1,797 acres
Size of Oregon Gulch RNA	1,047 acres	1,047 acres	1,047 acres	1,891 acres	1,047 acres
Land in LSR or Forest Health Reserve (FHR)	323 in FHR 10,975 in LSR	323 in FHR 8,871 in LSR	20,125 acres in LSR 7,245 acres in FHR	37,149 acres	323 in FHR 10,975 in LSR
Matrix land not in other allocations	9,389 acres	9,029 acres	0	564	9,389 acres
Roads closed or decommissioned	4 miles	0	21 miles	45 miles	0
Area available for OHV use	Limited to designated roads	Limited to designated roads	Limited to designated roads	0 OHVs prohibited	25,387 acres
Designated roads available for OHV	116 miles	105 miles	169 miles	0	120 miles
Potential Acquisition of Land	160 acres	0	720 acres	15,980 acres	160 acres
Land available for mineral entry	21,839 acres	21,839 acres	34 acres for administrative purposes	0	21,839 acres

Table S-3. Comparison of the Alternatives in the ACECs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
External CSEEA Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustment	•If acquired, expand CSEEA boundary to north to include the south ½ Section 16,T.40S.,R.4E. to add to Jenny Creek ACEC	•Expand Jenny Creek ACEC to include any newly acquired adjacent lands: School-house Meadows Spring complex, Shoat Springs and that portion of Jenny Creek just north of the Box-O Ranch	•No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustments to boundary described in Medford District RMP	**•Expand Pilot Rock ACEC to include all lands above 4400' that are contiguous to the rock itself** **•Expand Jenny Creek ACEC to include riparian reserve in Box-O Ranch, and the south ½ section 16,T.40S.,R.4E. (if acquired)** **•Add known fossil beds to Pilot Rock ACEC (map 41)**	**•Expand Jenny Creek ACEC to include Jenny Creek on Box-O Ranch** **•Expand Pilot Rock ACEC (see text)** **•Expand the Pilot Rock Mariposa Unit to include Oregon/California Trail on BLM land** **•Include Parsnip Lake and wetlands if acquired**	•No Adjustments to boundary described in Medford District RMP
Grazing	• Grazing allowed	•Grazing allowed	**•Managed grazing only to achieve ecological objectives**	**•Grazing allowed only under exceptional circumstances**	• Grazing allowed
Timber/PSQ	• No timber harvest	**•Manage forest for timber but not to interfere with key characteristics** **•Contribute to PSQ commitment**	**•Manage forest for timber but not to interfere with key characteristics** **•No PSQ commitment**	• No timber harvest	•No timber harvest
Transportation	•Follow Best Mgt. Practices: -Surfaced roads that are open all year -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	•Same as alternative A plus: •Improve and/or rock natural surface roads to Pilot Rock ACEC •Improve and maintain all existing roads	•Same as alternative A plus: •Use natural surface roads in Jenny Creek ACEC for administrative purposes only and install crossing over Jenny Creek •Maintain roads to Pilot Rock and parking lot	•Same as alternative A plus: •Jenny Creek ACEC: All natural surfaced roads would be closed and decommissioned. •Pilot Rock ACEC Unit: Pilot Rock Road to parking area open; roads south of parking area closed	Same as alternative A plus: •Natural surface roads - improved, maintained, and remain open

Table S-3. Comparison of the Alternatives in the ACECs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Off-Highway Vehicle Use	•Pilot Rock ACEC closed to OHV use •Jenny Creek ACEC limited to designated roads	•Pilot Rock ACEC closed to OHV use **•Jenny Creek ACEC restricted to existing roads**	**•Limited to designated roads**	**•Prohibited**	**•Pilot Rock ACEC restricted to existing roads** **•Jenny Creek ACEC restricted to existing roads**
Hiking/ Non-motorized Recreation	•Activities allowed that do not interfere with maintenance of key ACEC characteristics	•Activities allowed that do not interfere with maintenance of key ACEC characteristics	•Pilot Rock ACEC; Maintain parking and trail •Allowed in other ACECs.	•Pilot Rock ACEC; Maintain parking and trail •Allowed in other ACECs.	•Activities allowed but managed to promote maintenance of key ACEC characteristics •Develop campground at "the Licks" and improve stream crossing •Improve trail to Pilot Rock and place picnic tables near parking area
Forest Health (trees)	•Activities allowed but only to promote maintenance of key ACEC characteristics	•Activities allowed but only to promote maintenance of key ACEC characteristics	•Use silvicultural prescriptions to meet ecological objectives including restoration of riparian areas	•Prescribed fire and manual ground disturbance limited to exceptional circumstances.	•Activities allowed but only to promote maintenance of key ACEC characteristics
Grass/Shrub Woodland Communities Restoration Activities	•Activities allowed but only to promote maintenance of key ACEC characteristics	•Limit ground disturbance •Managed grazing and prescribed fire as a management tool permitted	•Prescribed fire permitted •Limited ground disturbance •Manage grazing to meet ecological objectives	•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Activities allowed [illegible] to promote maintenance of key [illegible] characteristics
Private Lands Acquisition	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity •Acquire land along Jenny Creek where possible	•No acquisition	•For Jenny Creek ACEC: Acquire from willing owners as available to expand area of riparian protection and restoration	•Jenny Creek ACEC: Acquire from willing sellers as available all private unimproved lands on Jenny Creek to including Fredenburg Springs and T.41S.,R.04E., Sec.16, S1/2, and the Schoolhouse Meadows Spring complex , Shoat Springs	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity
Special Forest Products	•Not Allowed	**•Allowed but must not interfere with maintenance of key characteristics**	•Not allowed	•Not allowed	•Not Allowed

XXVI

Table S-3. Comparison of the Alternatives in the ACECs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Horse/ Pack Stock Recreation	•Activities allowed that do not interfere with maintenance of key ACEC characteristics	•Not Allowed	•Allowed and monitored with options for future restrictions reserved if degradation occurs •Do not promote	•Allowed on existing roads and the PCNST only; no cross-country	•Activities allowed but managed to promote maintenance of key ACEC characteristics
Minerals Activities	•Activities allowed but managed to promote maintenance of key ACEC characteristics	•Allowed but could not interfere with management of key values	**•Closed to leasable mineral** **•Withdraw from mineral entry** **•Common mineral sales would be prohibited**	**•Closed to leasable mineral** **•Withdraw from mineral entry** **•Common mineral sales world be prohibited**	•Activities allowed but managed to promote maintenance of key ACEC characteristics
Facilities/ Rights-of-way	•Avoid rights-of-ways in the following areas: -ACECs - Sensitive species habitat •Exclude rights-of-ways in known special status plant species sites	•Allowed but could not interfere with management of key values	• Same as Alternative A	• Same as Alternative A	•Same as Alternative A

Table S-4. Comparison of the Alternatives in the RNAs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
External CSEEA Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustment to boundary described in Medford District RMP	•No adjustment to boundary described in Medford District RMP	•No expansion outside of RMP CSEEA boundary except to include newly acquired adjacent lands if any.	•No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustment	•No adjustment	**•Expand Oregon Gulch RNA to new boundary of Jenny Creek ACEC on Box-O Ranch, to include wetland and adjacent private land.** **•Expand Scotch Creek RNA to include entire Scotch Creek watershed to the boundary of the enlarged Pilot Rock ACEC unit.**	•No Adjustments to boundary described in Medford District RMP

Table S-4. Comparison of the Alternatives in the RNAs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Grazing	• Grazing allowed	•Grazing allowed	**•Permitted for research purposes/ managed to achieve ecological objectives.** **•Will not interfere with key characteristics of RNA**	**•Grazing allowed only under exceptional circumstances**	• Grazing allowed
Timber/PSQ	•No timber harvest in Oregon Gulch RNA •Allowed in Scotch Creek RNA & contributes to PSQ	**•Timber harvest for scientific research or demonstration** **•No PSQ commitment**	**•Timber harvest for scientific research or demonstration** **•No PSQ commitment**	**•No timber harvest**	•No timber harvest in Oregon Gulch RNA •Allowed in Scotch Creek RNA & contributes to PSQ
Transportation	•All roads closed	•Same as alternative A plus: •Block existing unencumbered roads	•Same as alternative A plus: •Block access to jeep road from Schoheim road	•Same as alternative A plus: •Oregon Gulch RNA: Gate access •Scotch Creek RNA: Decommission all natural surfaced roads: Schoheim Road in expanded RNA; Lone Pine Ridge Road to Schoheim Rd.; obliterate the jeep road on ridge between east and west fork of Scotch Creek.	Same as alternative A plus: •No cross-country travel •Surfaced roads open all year. •Natural surface roads closed during wet season
Off-Highway Vehicle Use	•Closed to OHV use	•Closed to OHV use	•Not permitted in Scotch Creek ACEC **•Oregon Gulch on designated roads only:**	•Prohibited	•Closed to OHV use
Hiking/ Non-motorized Recreation	•Activities allowed that do not interfere with maintenance of key RNA characteristics	•Activities allowed that do not interfere with maintenance of key RNA characteristics	•Only on existing trails	•Only on existing trails	•Activities allowed but managed to promote maintenance of key RNA characteristics
Forest Health (trees)	•Activities allowed but only to promote maintenance of key RNA characteristics	•Activities allowed but only to promote maintenance of key RNA characteristics	•Ecological restoration activities permitted to meet key characteristics objectives for RNA	•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Activities allowed but only to promote maintenance of key RNA characteristics
Grass/Shrub Woodland Communities Restoration Activities	•Activities allowed but only to promote maintenance of key RNA characteristics	•Limit ground disturbance •Managed grazing and prescribed fire as a management tool permitted	•Limit ground disturbance •Manage grazing to meet ecological objectives	•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Activities allowed but only to promote maintenance of key RNA characteristics

Table S-4. Comparison of the Alternatives in the RNAs

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Private Lands Acquisition	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity	•No acquisition	•For Oregon Gulch RNA: Acquire contiguous adjacent lands from willing owners as available	•Oregon Gulch RNA: Acquire contiguous adjacent land from willing owners as available	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity
Special Forest Products	•Not Allowed	**•Allowed but must not interfere with maintenance of key characteristics**	•Not allowed	•Not allowed	•Not Allowed
Horse/ Pack Stock Recreation	•Activities allowed that do not interfere with maintenance of key RNA characteristics	•Activities allowed that do not interfere with maintenance of key RNA characteristics	•Do not encourage	**•Not allowed**	•Activities allowed but managed to promote maintenance of key RNA characteristics
Minerals Activities	•Closed to leasable mineral •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited	•Closed to leasable mineral •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited	•Closed to leasable mineral •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited	•Closed to leasable mineral •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited	•Closed to leasable mineral •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited
Facilities/ Rights-of-way	•Exclude rights-of-ways in the Research Natural Areas	**•Allowed but could not interfere with management of key values**	• Same as Alternative A	• Same as Alternative A	•Same as Alternative A

Table S-5. Comparison of the Alternatives in the Matrix

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
External CSEEA Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP (map 39)	**•Eliminate RMP mapped connectivity corridor (map 40)** **•Exclude sections 19 and 20 in the Cottonwood drainage west of Interstate 5**	**•Eliminate RMP mapped connectivity corridor (map 41)**	•Does not apply. **No Matrix in this alternative (map 42)**	•No Adjustments to boundary described in Medford District RMP (map 43)
Internal Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustments to boundary described in Medford District RMP	•No adjustment to boundary described in Medford District RMP	**•Disperse current matrix allocation lands into other allocations (ACEC, RNA, LSR).**	•No Adjustments to boundary described in Medford District RMP

Table S-5. Comparison of the Alternatives in the Matrix

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Grazing	• Grazing allowed	•Grazing allowed	**•Managed grazing only to achieve ecological objectives**	**•Does not apply. No Matrix in this alternative.**	• Grazing allowed
Timber/PSQ	•Timber harvest on sustainable basis. •Contributes to PSQ	•Managed for timber production to contribute toward PSQ commitment	**•Matrix land converted to Forest Health Reserve** **•No PSQ commitment**	•Does not apply. **No Matrix in this alternative**	•Timber harvest on sustainable basis. •Contributes to PSQ
Transportation	•Follow Best Mgt. Practices: -Surfaced roads that are open all year -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	•Same as alternative A plus: •Improve and maintain all existing roads •Improve drainage to control erosion •Up-grade culverts to meet 100 year events •Up-grade roads to minimum haul standards needed for logging •Construct new roads as needed for management purposes •Improve, surface and maintain and Schoheim road •Improve road to Soda Mtn. Communication site	•Same as alternative A plus: •No new road construction except for reciprocal agreements •Close Schoheim road: from Section 11 near Salt Creek (close to PP&L powerline) to the Pilot Rock road	•Does not apply. No Matrix in this alternative Why? Matrix shifted to other designations RNA, LSR	Same as alternative A except: •Natural surface roads-maintained and remain open
Off-Highway Vehicle Use	•Limited to designated roads	•Limited to designated roads	•Limit to designated roads	•Does not apply. No Matrix in this alternative	**•Open to OHV use**
Hiking/ Non-motorized Recreation	•Activities allowed •Rebuild the historic Bean Cabin	•All forms allowed	•All forms allowed	•Does not apply. No Matrix in this alternative	•Activities allowed •Improve OR/CA trail for hiking •Develop picnic area near Boccard Point and Soda Mtn. •Build trails to Cathedral Cliffs and Scotch Creek Falls •Rebuild the historic Bean Cabin

XXX

Table S-6. Comparison of the Alternatives in the Jenny Creek LSR

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
External CSEEA Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustment	**•Include LSR lands up to State Hwy. 66 (map 41)**	**•Adjust CSEEA boundary to include all LSR lands (map 42)**	•No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustments	•No adjustment	**•Adjust boundaries as described in LSR assessment. Also add any Matrix acres in the CSEEA (RMP boundary) area that are not included in the expanded ACECs and RNAs converted to LSR**	•No Adjustments to boundary described in Medford District RMP
Grazing	• Grazing allowed	•Grazing allowed	**•Limited use permitted** **•Ensure achievement of late-successional objectives and riparian protection.**	**•Only under exceptional circumstances**	• Grazing allowed
Timber/PSQ	•Allowed only to meet LSR objectives •Does not contribute to PSQ	•Manage to meet LSR objectives (see LSR plan) •No PSQ commitment	•Manage to meet LSR objectives (see LSR plan) •No PSQ commitment	•No harvest except to achieve LSR objectives and all CSEEA lands would be excluded from Medford District timber harvest level determinations (No PSQ commitment)	•Allowed only to meet LSR objectives •Does not contribute to PSQ

Table S-6. Comparison of the Alternatives in the Jenny Creek LSR

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Transportation	•Follow Best Mgt. Practices: -Surfaced roads open all year. -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	•Same as alternative A plus: •Improve and maintain all existing roads •Improve drainage to control erosion •Improve culverts to meet 100 year events •Improve roads to minimum haul standards needed for logging •If easements are obtained: Improve, surface and maintain Randcore Pass road through Agate Flat to California; Skookum Creek road and Schoheim road	•Same as alternative A plus: •Maintain Schoheim Road from Copco Road , including lower crossing on Jenny Creek, west to Skookum Road •Pursue legal access to Jenny Creek crossing off Copco Road	•Same as alternative A plus: •Paved roads remain open •Main arterial roads open: Pilot Rock Rd., Emigrant Cr. Road; Baldy Cr. Road, Soda Mtn. Road, Lincoln Cr. Road, Fredenburg Road •Decommission or gate most rocked roads •Close and/or decommission all natural surfaced roads without reciprocal agreements including: portions of to the WSA boundary and roads •Obliterate most of the Pilot Rock Jeep Road, unnamed jeep road on south slope of Soda Mountain, and the Jeep Road crossing the WSA.	Same as alternative A except: •Natural surface roads - maintained and remain open
Off -Highway Vehicle Use	•Limited to designated roads	•Limited to designated roads	•Limited to designated roads	**•Prohibited**	**•Open to OHV use**
Hiking/ Non-motorized Recreation	•Activities allowed	•Activities allowed	•All forms allowed	•All forms allowed	•Activities allowed
Forest Health (trees)	•Activities allowed only to meet LSR objectives	•Activities allowed only to meet LSR objectives	•Restoration and reforestation of existing plantations permitted •Understory thinning in mature or natural stands permitted when necessary to achieve late-successional objectives	•Restoration and reforestation of existing plantations permitted. •Use of prescribed fire to meet LSR objectives permitted. •Ground disturbance limited	•Activities allowed only to meet LSR objectives

Table S-6. Comparison of the Alternatives in the Jenny Creek LSR

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Grass/Shrub Woodland Communities Restoration Activities	•Activities allowed only to meet LSR objectives	•Prescribed fire permitted •Limit ground disturbance •Grazing managed not to interfere with attainment of LSR objectives	•Prescribed fire permitted •Limited ground disturbance •Manage grazing to meet LSR objectives	•Restoration and reforestation of existing plantations permitted. •Permit use of prescribed fire to meet LSR objectives •Limit Ground disturbance	•Activities allowed only to meet LSR objectives
Private Lands Acquisition	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	**•No acquisition**	•Acquire lands from willing owners based on criteria in Chapter 4 of Jenny Creek LSR assessment	•Acquire all private unimproved and contiguous lands with in the Alternative D CSEEA boundary (map 42)	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance recreation management opportunities
Special Forest Products	•Limited activities that must not interfere with attainment of LSR objectives	•Allowed but must not interfere with attainment of LSR objectives	•Personal use allowed	**•Not allowed**	•Limited activities that must not interfere with attainment of LSR objectives.
Horse/ Pack Stock Recreation	•Activities allowed	•Limited activities that must not interfere with attainment of LSR objectives.	•Allowed	**•Allowed on existing roads and the PCNST only; no cross-country travel**	•Activities allowed
Minerals Activities	•Open for leaseable, locatable and saleable minerals	•Open for leaseable, locatable and saleable minerals	**•Closed to leasable mineral** **•Withdrawn from mineral entry** **•Common mineral sales would be prohibited**	**•Closed to leasable mineral** **•Withdrawn from mineral entry** **•Common mineral sales would be prohibited**	•Open for leaseable, locatable and saleable minerals
Facilities/ Rights-of-way	•Avoid rights-of-ways in the Late-Successional Reserves	•Allowed but could not interfere with management of LSR objectives	• Same as Alternative A	• Same as Alternative A	•Avoid rights-of-ways in the Late-Successional Reserves

Table S-7. Comparison of the Alternatives in the Box-O Ranch					
	ALTERNATIVE A	**ALTERNATIVE B**	**ALTERNATIVE C**	**ALTERNATIVE D**	**ALTERNATIVE E**
External CSEEA Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustment	•If acquired, expand CSEEA boundary to north to include the south ½ Section 16,T.40S.,R.4E.	**•Does not apply. Box-O lands re-allocated under this alternative.**	•No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments	•No Adjustments to boundary described in Medford District RMP	•No adjustments	•If acquired, expand Box-O boundary to north to include the south ½ Section 16, T.40S.,R.4E.	**•Disperse these lands into other allocations (ACEC, RNA, LSR).**	•No Adjustments to boundary described in Medford District RMP
Grazing	• Grazing allowed	•Grazing allowed	**•Use limited grazing to achieve management objectives while ensuring riparian restoration.**	•Does not apply. Box-O lands re-allocated under this alternative.	• Grazing allowed
Timber/PSQ	•Timber harvest on sustainable basis. •Contributes to PSQ	•Manage as matrix to meet PSQ commitments	**•Forest land converted to Forest Health Reserve** **•No PSQ commitment**	•Does not apply. Box-O lands re-allocated under this alternative.	•Timber harvest on sustainable basis. •Contributes to PSQ
Transportation	•Restricted to administrative use only •Closed Nov.15 to April 1 •Follow Best Mgt. Practices: -decommission roads not needed for future mgt.	•Same as alternative A plus: •Improve and maintain all existing roads •Improve drainage to control erosion •Improve culverts to meet 100 year.	•Same as alternative A plus: •Roads would be surfaced for extended season use and there would be no seasonal restriction.	•Does not apply. Box-O lands re-allocated under this alternative.	Same as alternative A plus: •Restricted to existing roads which would be rocked, maintained and remain open.
Off-Highway Vehicle Use	•Restricted to administrative use only •Closed Nov.15 to April 1	•Restricted to administrative use only •Closed Nov.15 to April 1	•Administrative use only	•Does not apply. Box-O lands re-allocated under this alternative	•Restricted to administrative use only
Hiking/ Non-motorized Recreation	•Activities allowed	•Activities allowed	•All forms allowed	•Does not apply. Box-O lands re-allocated under this alternative.	•Activities allowed •Develop picnic area and shelter •Install kiosk
Forest Health (trees)	•Use all techniques available for restoration and reforestation	•Use all techniques available for restoration and reforestation	•Use silvicultural prescriptions to meet ecological objectives including the restoration of riparian areas.	•Does not apply. Box-O lands re-allocated under this alternative.	•Use all techniques available for restoration and reforestation

Table S-7. Comparison of the Alternatives in the Box-O Ranch

	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C	ALTERNATIVE D	ALTERNATIVE E
Grass/Shrub Woodland Communities Restoration Activities	•Use all techniques available for restoration	•Use of prescribed fire, grazing and cultivation to restore grass	•Prescribed fire, grazing and cultivation to restore grass	•Does not apply. Box-O lands re-allocated under this alternative	•Use all techniques available for restoration
Private Lands Acquisition	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	**•No acquisition**	•Acquire contiguous adjacent lands from willing owners as available, particularly riparian habitat, and south ½ of Section 16,T40S.,R.4E.	•Does not apply. Box-O lands re-allocated under this alternative.	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance recreation management opportunities
Special Forest Products	•Limited activities for personal use only.	•Allowed	•Personal use allowed •Allowed and monitored with options for future restrictions reserved if degradation occurs •Do not promote	•Does not apply. Box-O lands re-allocated under this alternative.	•Limited activities for personal use only allowed
Horse/ Pack Stock Recreation	•Activities allowed	•Limited activities for personal use only allowed	•Allowed and monitored with options for future restrictions reserved if degradation occurs •Do not promote	•Does not apply. Box-O lands re-allocated under this alternative.	•Activities allowed
Minerals Activities	•Open for leaseable, locatable and saleable minerals	•Open for leaseable, locatable and saleable minerals	**•Closed to leasable mineral** **•Withdrawn from mineral entry** **•Common mineral sales would be prohibited**	•Does not apply. Box-O lands re-allocated under this alternative.	•Open for leaseable, locatable and saleable minerals
Facilities/ Rights-of-way	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •Avoid rights-of-ways in the known wetlands	•Allowed	• Same as Alternative A	•Does not apply. Box-O lands re-allocated under this alternative.	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •Avoid rights-of-ways in the known wetlands

Environmental Consequences

Analysis Assumptions and Guidelines

The analysis of the environmental consequences of the alternatives was based on the following assumptions and guidelines:

1. The alternatives would be implemented substantially, as described in Chapter 3, including Management Common To All Alternatives.
2. The Bureau of Land Management would have sufficient funding and personnel to implement and enforce the plan.
3. Current trends in recreation use would continue or increase.
4. The planning period for the analysis is the next 15 years. Short-term impacts are those that would occur during the first five years of plan implementation. Long-term impacts are those that would occur beyond the first five years.
5. Specific actions to protect human life would be taken regardless of the management criteria in the plan alternatives.
6. Livestock grazing would continue to be governed by applicable laws and regulations.
7. Research and monitoring would be funded.
8. The Aquatic Conservation Strategy and Best Management Practices (RMP, Appendix D) are common to all alternatives.

Summary of Environmental Consequences

The following tables listed briefly summarize the effects of the proposed alternatives to the important resource, process, or value(s) of the CSEEA. In most cases, summarizing only gives a broad overview of the effects to the important resource, process, or value. A compete analysis of the environmental consequences as a result of the proposed alternatives can be found in Chapter 4.

XXXVII

Table S-8. Trends toward Desired Condition for Ecosystem Health

Landscape Criteria	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Late-Seral Conifer Continuity consequent to CSEEA boundary changes	Decline	Decline	Improve	Improve	Unaffected
Late-seral Conifer Continuity consequent to private land acquisition	Unaffected	Decline	Improve	Improve	Unaffected
Late-seral Conifer Fragmentation	Decline	Decline	Improve	Improve	Decline
Percent Acute Disturbance	Decline	Decline	Improve	Improve	Decline
Recovery of Current Acute Disturbance	Unaffected	Decline	Improve	Improve	Decline
Reintroduction of Fire as Ecosystem Process	Unaffected	Decline	Improve	Decline	Unaffected
Disturbance Patch Size	Unaffected	Unaffected	Improve	Decline	Unaffected
Frequency of Disturbance (fire and silviculture)	Unaffected	Decline	Improve	Decline	Decline
Disturbance Severity	Unaffected	Decline	Improve	Decline	Unaffected
Private Land Acquisition for Maintaining Rare and Functionally Important Plant Communities	Unaffected	Decline	Improve	Improve	Decline
Maintenance of Rare Plant Communities	Unaffected	Decline	Improve	Decline	Decline
Practice Adaptive Management including: Pilot Studies; Multiple Treatments; Monitoring	Unaffected	Decline	Improve	Improve	Decline

Table S-9. Potential for Adverse Effects to Cultural Resource

Activity	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Grazing	Low	Low-Moderate	Low-Moderate	Low	Low
Timber	Low-Moderate	Low-Moderate	Low	Low	Low-Moderate
Roads	Low-Moderate	Low-Moderate	Low-Moderate	Moderate	Low-Moderate
OHV	High	High	Low-Moderate	None	Moderate-High
Recreation	Moderate	Moderate	Moderate	Low	Moderate
Burning	Low	Low	Low	Low	Low
Minerals	Low-Moderate	Low-Moderate	None	None	Low-Moderate

Table S-10. Adverse Effects on Soils as a result of Alternatives

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Moderate	Moderate	Low	Very Low	Moderate

Table S-11. Cumulative Effects on Hydrology

Resource Value Affected	Potential for Cumulative Effects on Stream flow by Alternative				
	A	B	C	D	E
Peak Flows	Low-Moderate	Moderate	Very Low-Low	Very Low	Low-Moderate
Low Flows	Low	Low-Moderate	Very Low-Low	None -Very Low	Low
Water Quality Parameter Affected	**Potential for Cumulative Effects on Water Quality by Alternative**				
	A	**B**	**C**	**D**	**E**
Temperature/Dissolved Oxygen	Low	Low-Moderate	Very Low-Low	Very Low	Low-Moderate
Bacteria/Pathogens	Low-Moderate	Low-Moderate	Low	Very Low	Low-Moderate
Turbidity/Sediment	Low-Moderate	Low-Moderate	Low	Very Low	Low-Moderate

Table S-12. Summary of Effects to Fish and Aquatic Ecosystems

Resource Value Affected	Environmental Effects by Alternatives				
	A	B	C	D	E
Fish populations (from fishing pressure)	Neutral	Negative	Positive	Positive	Very negative
Stream habitat quality	Negative	Very Negative	Positive	Very positive	Negative
Springs and wetlands	Neutral	Very Negative	Very positive	Very positive	Very negative
Riparian condition	Neutral	Negative	Positive	Neutral	Negative

Table S-13. Summarizes the Overall Effects of Proposed Alternatives on Special Status and Special Interest Species

Species Affected	Alt. B	Alt. C	Alt. D	Alt. E
Birds				
Bald Eagle	=	=	=	=
Peregrine Falcon	-	+	+	- -
Lewis Woodpecker	=	=	=	=
Greater Sandhill Crane	=	=	+	=
Northern Saw-whet Owl	-	=	+	=
Western Meadowlark	-	+	+ +	=
Western Bluebird	+	=	-	=
White Pelican	=	=	=	=
Northern Spotted Owl	-	+	+	=
Golden Eagle	-	=	+	=
Northern Goshawk	-	=	+	=
Great Gray Owl	-	=	+ +	=
White- Headed Woodpecker	-	+	+	=
Black-backed Woodpecker	-	+	+	=
Northern Three-toed Woodpecker	-	+	+	=
Pileated Woodpecker	-	+	+	=
Flammulated Owl	-	+	+	=
Pygmy Nuthatch	-	+	+	=
Reptiles and Amphibians				
Western Pond Turtle	=	+	+	=
Cascade Frog	=	+	+	=
Tailed Frog	=	+	+	=
California Mountain Kingsnake	-	+	+	
Common Kingsnake	-	+	+	-

Table S-13. Summarizes the Overall Effects of Proposed Alternatives on Special Status and Special Interest Species

Species Affected	Alt. B	Alt. C	Alt. D	Alt. E
Mammals				
Fisher	–	+	+	–
American Marten	–	+	+	–
Pacific Pallid Bat	–	+	+	–
Townsend's Big-Eared Bat	=	+	+ +	–
Fringed Myotis	–	+	+	=
Terrestrial Mollusks (slugs and land snails)				
Helminthoglypta hertleini	=	=	=	=
Megomphix hemphilli	–	+	+ +	=
Monadenia Chaceana	–	+	+ +	=
Trilobopsis tehemana	–	+	+ +	=
Prophysaon dubium	–	+	+ +	=
Prophysaon coeruleum	–	+	+ +	=
Special Interest Species				
Black-tailed Deer	–	+	+ +	– –
Roosevelt Elk	–	+	+ +	– –

= :	Expected effects of this alternative are identical or very similar to those of the baseline alternative (A).
+ :	Expected effects of this alternative are beneficial above the conditions provide by the baseline alternative.
+ + :	Expected effects of this alternative are beneficial above the conditions provide by the baseline alternative, and better than other alternatives marked with a single "+".
– :	Expected effects of this alternative are more detrimental to the species than those expected under the baseline alternative.
– – :	Expected effects of this alternative are more detrimental to the species than those expected under the baseline alternative, and more detrimental than other alternatives marked with a single "-"

XLI

Table S-14. Trend towards desired condition for Plant Community

Grassland, Shrubland and Woodland Community Criteria	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Improve fire-induced balance of conditions	Decrease	Decrease	Increase	Decrease	Decrease
Maintenance of vigorous native herbaceous understory	Unaffected	Decrease	Large Increase	Increase	Unaffected
Reduce weed invasion (including annual grasses)	Unaffected	Decrease	Large Increase	Increase	Decrease
Protect/enhance semi-wetlands, wetlands, riparian areas	Unaffected	Decrease	Increase	Increase	Unaffected
Recreate oak savanna where feasible	Unaffected	Unaffected	Increase	Decrease	Unaffected
Maintenance/restoration of rare plant communities	Unaffected	Decrease	Increase	Decrease	Decrease

Table S-15. Effects to Special Status Plants and Associated Habit

Resource Value Affected	Overall Potential for Adverse Effects by Alternative				
	A	B	C	D	E
SSP Species	Low - Moderate	Low - Moderate	Low	Low	Low - Moderate
SSP Habitat	Low - Moderate	Moderate	Low - Moderate	Low	Moderate

Table S-16. Effects of Alternatives to Weed Establishment and Spread

Resource Value Affected	Overall Potential for Adverse Effects by Alternative				
	A	B	C	D	E
Weed Establishment and Spread	Low - Moderate	Moderate	Low - Moderate	Low	Moderate

Table S-17. Potential Changes to the Transportation System

ACCESS	A	B	C	D	E
Legal access for the general public	Very low	Low	High	High	Very low
Legal access for land management by BLM, Contractors, and Livestock Operators	Very low	Low	High	High	Very low
Legal access to private property	Very low	Low	High	High	Very low
Fire Suppression	Very low	Low	High	High	Very low

Table S-18. Trends of that Affect Forest Health					
Disturbance Agents	**Alternative A**	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**
Disturbance Agents					
Disease	Increases	Increases	Decreases	Decreases	Decreases
Insects	Increases	Increases	Decreases	Decreases	Decreases
Windthrow	Increases	Increases	Decreases	Decreases	Decreases
Wildfire	Increases	Increases	Decreases	Decreases	Decreases
Trends of Forest Health Characteristics					
Tree Vigor	Decreases	Decreases	Increases	Stable	Increases
Snags/ CWD	Stable	Decreases	Increases	Increases	Increases
Desired Species Composition	Decreases	Decreases	Increases	Increases	Increases

Table S-19. Summary of Effects of Alternative on Timber Harvest				
Alternative A	**Alternative B**	**Alternative C**	**Alternative D**	**Alternative E**
Small departure from present RMP harvest level, harvest level would remain the same.	Small departure from present RMP harvest level, harvest level would remain the same	Moderate departure from present RMP harvest level, harvest level would go down	Large departure from present RMP harvest level, harvest would not occur	Small departure from present RMP harvest level, harvest level would remain the same

Table S-20. Summary Comparison of Effects of Alternatives on Fire			
Alternative B	**Alternative C**	**Alternative D**	**Alternative E**
Response Time for Fire Suppression			
Response time is increased compared to Alternative A	Response time is decreased compared to Alternative A	Response time is substantially decreased compared to Alternative A	Response time is increased compared to Alternative A
Prescribed Fire			
The use of prescribed fire is identical to the Alternative A	The use of prescribed fire is identical to the Alternative A	The use of prescribed fire is limited compared to the Alternative A	The use of prescribed fire is identical to the Alternative A

Table S-21. Effects of Alternatives on Rangeland Resources

Resource Value	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Rangeland Health	Positive	Positive as rangeland health standards must be met	Positive unless herbivory is reduced	Positive in the short term Negative in the long term	Positive
Socio-Economic Factors Affecting Livestock Operations	Positive to slightly negative due to increased constraints and possibility of eliminating open space	Positive	Negative due to increased constraints and possibility of reducing open space	Very Negative	Positive to slightly Negative

Table S-22. Effects of Alternatives on Recreation

Activities	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
OHV use	Moderately Negative	Minimal	Moderately Negative	Very Negative	Very Positive
Non-Motorized	Neutral	Neutral	Positive	Minimal	Positive
Horse/Pack Stock	Positive	Minimal	Minimal	Moderately Negative	Positive
Snowmobile	Moderately Negative	Minimal	Moderately Negative	Very Negative	Very Positive

Table S-23. Negative Effects of Alternatives on Land Use Allocations

Activities	Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Impacts to Environment	Minimal to moderate	Minimal to moderate	None to Minimal	None to Minimal	Minimal
Impacts to Private Interests	None to Minimal	None to Minimal	Maximum	Maximum	Minimal to moderate
Impacts to Commercial Interests	Minimal	None to Minimal	Maximum	Maximum	Minimal to moderate
Impacts to the Agency (workload)	Minimal to Moderate	Minimal to Moderate	Maximum	Maximum	Minimal to moderate
Impacts to the Agency (workload)	Minimal to Moderate	Minimal to Moderate	Maximum	Maximum	Minimal to moderate

Table S-24: A Comparison of Social and Economic Effects of Alternatives

Issues/Concerns	A	B	C	D	E
Greensprings Community					
Collaboration	Neutral	Neutral	Neutral	Neutral	Neutral
Restoration	Negative	Negative	Positive	Positive	Negative
Restoration Employment	Neutral	Neutral	Neutral	Neutral	Neutral
Education	Neutral	Neutral	Neutral	Neutral	Neutral
Recreation Business Opportunities	Modest	Modest	Modest	Non-motorized only	Positive
Soda Mountain Wilderness Council					
Eliminate/minimize roads, grazing, OHVs	Slightly Positive	Very Negative	Positive	Very Positive	Negative
Allow but don't encourage Recreation	Neutral	Neutral	Neutral	Very Positive	Very Negative
Jackson County					
Management Options Open	Positive	Positive	Negative	Very Negative	Positive
Economic Health	Positive	Positive	Negative	Very Negative	Positive
Agriculture					
Steady or expanding AUMs	Positive	Positive	Negative	Very Negative	Positive
Forestry/Wood Products					
Maintain Log Supply	Positive	Very Positive	Negative	Very Negative	Positive
Recreation (Motorized)					
Expanded Access	Neutral	Neutral	Negative	Very Negative	Very Positive
Recreation (Non-Motorized)					
Current levels meet demand	Neutral	Neutral	Neutral	Loss of Equestrian	Positive

Chapter 1 - Purpose and Need for the plan

Chapter 1 - Purpose and Need

Introduction

The Cascade Siskiyou Ecological Emphasis Area (CSEEA) was established in the 1994 Northwest Forest Plan and the 1995 Medford District Resource Management Plan (RMP) primarily due to its unique, diverse ecological and biological characteristics. The RMP identified the CSEEA as a Special Area Land Use Allocation and indicated that a site-specific management plan would be developed in coordination with the Redding BLM Field Office. The CSEEA consists of lands with special designations based on important resource value(s). The Soda Mountain Wilderness Study Area is the core of the CSEEA and is surrounded by two Resource Natural Areas (RNAs), two Areas of Critical Environmental Concern (ACECs), a Late-Successional Reserve (LSR), a wildlife area and a historic ranch. All of these areas were recognized for their specific scientific, historic, biological, geological, hydrological, ecological and/or archaeological value(s).

Although specific objectives apply to the different land use designations, the guiding principle for management of the CSEEA is to maintain, protect, restore or enhance relevant and important value(s). All other considerations are secondary to this guidance. The management alternatives presented in this plan are necessarily constrained to those values affording the required protection. As a result, the range of alternatives presented in this planning document for the CSEEA is narrower than is typical of BLM management plans.

The Federal Land Policy and Management Act (FLPMA) of 1976, as amended, directs the BLM to manage public land on the basis of multiple use and "in the manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resource, and archeological values." The term "multiple use" refers to the "harmonious and coordinated management of the various resources without permanent impairment of productivity of the land and the quality of the environment." Multiple use involves managing an area for various benefits, recognizing that the establishment of land use priorities and exclusive uses in certain areas are necessary to ensure that multiple uses can occur harmoniously across the landscape.

The RMP, FLPMA, and other mandates provide the direction for the preparation of this management plan. Within this guidance, many decisions remain about how best to maintain, protect, restore or enhance relevant and important values within the CSEEA and address major issues surrounding CSEEA management. The Medford District RMP directed the BLM Ashland Resource Area to coordinate with the BLM Redding in preparing this plan in order to begin making decisions. The CSEEA Plan will guide management activities on BLM administered land within the proposed CSEEA and allow for the use and protection of its resources.

This Draft Environmental Impact Statement (DEIS) will address the inclusion of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA, both located in California. In addition, potential boundary adjustments to the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA will also be considered in this planning document. The Plan will not address management activities within the boundary of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA. The management activities within the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA will be addressed by the Redding BLM Field Office in a forthcoming resource management plan amendment. Management activities for all Oregon BLM administered land inside the CSEEA boundary of consideration will be addressed in this plan.

The CSEEA Plan will achieve the goals of balancing resource use and protection in a manner that creates opportunities for public exploration and education, provides for progressive land stewardship, incorporates input from the scientific community and the public at large, and reflects the regional significance of CSEEA resources. The results of the CSEEA planning process to date are presented in this Draft Environmental Impact Statement (DEIS). This DEIS is specific to public land and, except for specifically identified areas associated with proposed boundary adjustments, management of private land adjacent to public lands within the CSEEA will not be addressed in this document.

Relationship of the DEIS to BLM Policies, and Other Plans

This DEIS is tiered to the *Medford District Resource Management Plan* (RMP) and the *Redding Resource Management Plan* (RRMP). Some of the alternatives are outside the scope of the RMP and would require an RMP amendment to fully approve and implement. If changes in land use allocations and/or management direction occurs as a result of this CSEEA Plan/EIS, this analysis and decision making process will meet requirements of the Bureau's regulation for RMP amendments found in 43 Code of Federal Regulations 1610.5-5. Since the authority to approve RMP amendments cannot be re-delegated to the field or district manager levels, any proposed changes in the RMP must be elevated to the OR/WA State Office for review and approval by the State Director.

In 1998, BLM Medford District completed a record of decision (ROD) for its *Integrated Weed Management Plan* (EA OR-110-98-14) which was tiered to the *Northwest Area Noxious Weed Control Program EIS* (March 1987). This DEIS is tiered to that EA and decisions made in that ROD are not readdressed in this document.

This DEIS is tiered to BLM's 1989 *Western Oregon - Management of Competing Vegetation EIS* for analysis of impacts of vegetation management activities on human health, and all other impacts from the use of herbicides, in management programs other than noxious weed control. The decisions made in that ROD are not readdressed in this document.

This DEIS is tiered to the Record of Decision for the *BLM Oregon Wilderness Study* of October 1991.

In September 1984, BLM approved a ROD for the *Medford Grazing Management Final EIS*. This document is tiered to that Final EIS and the decisions shown in the Rangeland Program Summary. Management of livestock will be addressed in this DEIS but will be specific to the CSEEA.

Planning Process

The target date for completion of the CSEEA Management Plan is Fall of 2000. To meet this objective, an inter-disciplinary planning team was formed in the Fall of 1999 to begin this inclusive planning process designed to guide the CSEEA into the next millennium.

The purpose of this plan is to provide both a set of decisions outlining management and to create a framework for future planning and decision-making. It is expected there will be a future need for subsequent and more detailed planning which will focus on specific resource management issues and implementation of management direction set forth in this plan.

In each subsequent activity plan and National Environmental Policy Act (NEPA) document, the BLM will include a description of the desired future condition of the land and resources involved, and will explain how the proposed activities would contribute to that desired future condition. At that time the BLM will conduct all surveys and clearances necessary to implement the plan.

Scoping Process

The first step in the planning process was to invite public participation. This "scoping" process invited a wide range of public comment to determine the significant issues to be addressed in the plan. The formal scoping period began with publication of the Notice of Intent to produce a Management Plan, which appeared in the Federal Register on August 27, 1999 (Volume 64, No.166, Pg. 46933). Written comments were accepted until October 29, 1999.

The scoping process invited public input through an informative brochure and comment response card. In addition, four field tours and one meeting were held to help identify significant issues. The tours and meeting were well attended and hundreds of scoping comments were received and processed. A complete outline of the scoping process is found in Chapter 5.

Issues

The purpose of the scoping process was the identification of significant issues to be addressed in the plan. For planning purposes, an "issue" is defined as a matter of controversy, dispute, or general concern over resource management activities, the environment, or land uses. In essence, issues help determine what decisions will be made in the plan and what the environmental analysis must address (via an EIS, as required by NEPA).

Based on scoping comments received and subsequent analysis and evaluation, major planning issues were identified. Those issues are listed below with a short description of why each is significant, as well as decisions regarding each issue that must be made in the plan. In addition to the issues identified in scoping, the plan will address basic environmental and management issues including native plant communities, recreational opportunities, forest health, access, CSEEA boundary, off-highway vehicle use, special forest products, water quality and wildlife habitat.

Issue: Grazing

Grazing is an issue of great concern to most members of the public; almost every response included this issue. Many express concern over the adverse effects of grazing for the ecology of the area; often mentioning the costs of government subsidy of ranchers. Others support retaining grazing practices, feeling that the proposed plan threatens their livelihood and way of life. This group views grazing to be a management tool for preventing fires and enhancing wildlife habitat.

Issue: Roads

Roads are seen by many as having a detrimental effect on land, water quality, wildlife and human experience (e.g., noise). Erosion issues are often raised. This group recommends decommissioning all non-residential roads and jeep trails and restriction of off-road vehicle use. Many other comments request maintained access for recreation and fire suppression. Of high concern is access for motorcycles and other off road vehicles.

Schoheim Road was mentioned often, both in regards to its degradation and its importance for access.

Issue: Timber Harvesting

Most oppose commercial harvesting due to adverse ecological effects. Others cite the importance of allowing some level of logging such as selective harvesting to provide jobs and reduce fire hazard. Restriction of this commodity use does not raise as much concern as restrictions on grazing by those opposed to the proposed Plan.

Issue: Mining

Mining was another commodity use of concern to those in support of ecological designation for the area, again because of its potential to lead to adverse ecological effects. Mining is not often mentioned by those against ecological designation.

Issue: Fragmentation

Many see the proposed Plan as a means to address the issue of fragmentation and to enhance connectivity by acquiring private holdings from willing landowners. Many respondents think the size of the area needs to be expanded significantly.

Issue: Unique Natural and Biological Values

A number of people cite the importance of retaining this particular area for its unique character. Often mentioned were its diversity, and fragility. Wildlife, native plants and insects were often mentioned, as were water quality and fish. Many are concerned about the spread of noxious weeds and further degradation of fragile meadows. These values are mentioned more often than old growth forests. Many in both groups mentioned Jenny Creek and Horseshoe Ranch as important biological sites.

Issue: Fire

Concerns are expressed across groups about fire suppression, including limited road access, and ability to introduce fire and develop adequate fire planning.

Issue: Capacity to Manage as a Protected Area

Agency capacity for adequate management of the proposed area is of concern. Among those areas mentioned as requiring adequate funding are law enforcement, scientific studies, restoration and monitoring.

Issue: Big Government

Concerns about government control are expressed by those opposed to the proposed CSEEA Management Plan. Of particular issue are combining Oregon and California jurisdictions, regulation and "taking" of private property, local autonomy, loss of personal freedom, lack of respect for way of life and livelihood.

Issue: Hiking and Non-motorized Recreation

Many request maintaining opportunity for enjoying the area for hiking and other forms of recreation. Among the benefits expressed are aesthetic and spiritual values, education opportunities, and economic benefits from recreation. Some commented that enhanced trails would benefit citizen management and monitoring. Many express the view that this proposed Plan would discriminate against young, old and handicapped who require motorized-vehicle access for enjoying the area.

Issue: Pacific Crest National Scenic Trail

Protection and expansion of trail corridors and services such as parking and interpretive information is requested. Equestrians and mountain bikes are not seen as compatible with hiking.

Issue: Combining California and Oregon Jurisdictions

Those in favor of the proposed Plan feel that adding California to the area would address concerns of protection and fragmentation; they generally support as large a designation as possible. Those opposed to the proposed Plan want to keep Oregon and California jurisdictions separate; they generally oppose non-local control.

Other Issues

Management Common to all Alternatives

There are several other important issues raised during scoping which are of concern to the public, but which have been adequately addressed in the Medford District's RMP, or are governed by existing laws and regulations. Because management of these issues has already been determined, management alternatives for those issues are not presented in this plan. These issues are discussed in further detail in the "Management Common to All Alternatives" section in Chapter 3.

- Management of Noxious Weeds
- Management of the Soda Mountain Wilderness Study Area
- Management of Fire Suppression Activities
- Management of Prescribed Fire
- Management of Archeological Sites
- Management of Special Use Activities
- Management of Riparian Areas consistent with the Aquatic Conservation Strategy
- Management of Fish and Wildlife (including hunting and fishing) by the State of Oregon
- Management of the Pacific Crest Trail
- Management of Acquired Lands
- Management of Special Status Species

Issues, Actions and Alternatives Considered but Eliminated

There were a few management alternatives suggested during scoping which were eliminated from detailed analysis because they were not deemed reasonable given the guidance of the RMP or for other reasons. Those alternatives, and reasons they were eliminated, are discussed in the "Alternatives Considered But Eliminated From Detailed Analysis" section at the end of Chapter 3. They include:

- Expanding the WSA boundary
- Full Recreation Development
- Eliminating Prescribed Fire
- Irrigating the Pastures on the Box-O Ranch

Development of Management Strategies and Alternatives

Defining the planning issues was the first step in narrowing the scope of possible actions that would be carried forward in the planning process. The planning team then developed management strategies aimed at providing viable options for addressing the planning issues. The management strategies provided the building blocks from which the general management scenarios, and eventually, the more detailed alternatives, were developed. The result of this process is the range of management alternatives provided in this Draft Management Plan/DEIS.

Summary of Planning Criteria and Considerations

The process described above was designed to identify a viable range of management alternatives given the comments and issues identified during public scoping. At the same time, the legal requirements and directives governing the planning process were considered in determining the range of management alternatives and in developing the framework for the Draft Management Plan/DEIS. The following is a summary of key planning considerations:

Federal Land Policy and Management and National Environmental Policy Acts

The development of this management plan is guided by the legal authority found in the Federal Land Policy and Management Act (FLPMA) of 1976, as amended, and the National Environmental Policy Act (NEPA) of 1969, as amended. In developing land use plans, FLPMA and NEPA require that the BLM use an interdisciplinary approach and provide opportunities for public involvement and interagency coordination. In addition, FLPMA requires land use plans to:

- Give priority to the designation and protection of Areas of Critical Environmental Concern (including Research Natural Areas)
- Consider the present and potential uses of public lands
- Consider scarcity of values involved
- Rely on public land inventories
- Comply with pollution-control laws
- Manage Wilderness Study Areas to ensure that their potential wilderness values are not impaired

Both NEPA and FLPMA require BLM to provide the public with information about the effects of implementing land use plans.

Since the passage of FLPMA, the BLM identified an area, now within the CSEEA, for wilderness review. This area, the Soda Mountain Wilderness Study Area (WSA), has been managed under the BLM's Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP) (BLM Manuel H-8550-1) since it was identified. The objective of the IMP is to manage those lands so as not to impair their suitability for designation as wilderness. The Soda Mountain WSA will continue to be managed under the IMP, and the CSEEA plan will only be carried out to the extent that it does not conflict with the IMP, unless action is taken by Congress. If Congress decides not to designate any WSA lands as wilderness, those lands would then be managed under the provisions of the CSEEA Plan. The evaluation of additional lands for WSA status is outside the scope of this plan.

Planning Criteria

In addition to planning considerations of FLPMA, BLM planning regulations (43 CFR 1610) require preparation of planning criteria to guide the development of all resource management plans. Planning criteria ensures that plans are tailored to identified issues and ensure that unnecessary data collection and analysis are avoided. Planning criteria are based on applicable law, agency guidance, public comments, and coordination with other Federal, state and local governments, and Native American Indian tribes.

The planning criteria used in developing the Cascade Siskiyou Ecological Emphasis Area Plan are as follows:

- The plan will be completed in compliance with FLPMA and all other applicable laws.
- The CSEEA Planning Team will work cooperatively with the State of Oregon, tribal governments, county and municipal governments, other Federal agencies, and all others interested groups, agencies and individuals.
- The CSEEA plan will establish the guidance upon which the BLM will rely in managing the CSEEA.
- The planning process will include an Environmental Impact Statement that will comply with National Environmental Policy Act standards.
- The plan will emphasize ecological and historic resources of the CSEEA. It will also identify opportunities and priorities for research and monitoring related to the key resource values for which the CSEEA was created.
- The plan will recognize valid existing rights within the CSEEA. The plan will also outline the process the Bureau of Land Management will use to address applications or notices filed after the completion of the plan on land use authorizations.
- The plan will recognize the State's responsibility to manage hunting and fishing within the CSEEA.
- The plan will address transportation and access, and will identify where better access is warranted, where access should remain as is, and where decreased access is appropriate to protect CSEEA resources and manage visitation.
- The plan will address livestock grazing and lay out a strategy for ensuring that proper livestock grazing practices are followed.
- The plan will identify plant communities and address their health and possible restoration.
- The plan will set forth a framework for managing recreational activities to provide for enjoyment of visitor experiences consistent with the ecological objectives of the key resource values.

Significant Decisions Proposed in the Plan

This Draft CSEEA Management Plan/DEIS provides a broad array of decisions concerning major resource issues, especially in the action alternatives (Alternatives B, C, D and E). The decisions vary among the respective alternatives, and their level of specificity also differs. As in the case of any resource management plan, it is expected that subsequent activity planning will occur, consistent with the guidance included in this plan, in order to make decisions on individual activities. For example, this could include the management of outfitter and guide services in a given area or allowances for a designated hiking trail system. The most significant areas in which this plan offers decisions within the CSEEA include:

- CSEEA boundary
- Livestock Grazing
- Timber Management
- Transportation System
- Off-Highway Vehicle Use
- Hiking/Non-Motorized Vehicles
- Forest Health
- Grass/Shrubs/Woodland Community Health
- Private Land Acquisitions
- Special Forest Products
- Horse/ Pack Stock Recreation
- Minerals
- Facilities/Rights-of-Way

What's Next in the Planning Process

Availability of this Draft Management Plan/DEIS was announced in the Federal Register and in local media. Publication of the Notice of Availability opens a comment period for the public to submit comments on the draft. During this period, public meetings will be held in locations and times announced in the letter accompanying this document and in local media.

After analysis and consideration of public comments on the draft, the Proposed CSEEA Management Plan/Final EIS is expected to be released in the summer of 2000. The Approved CSEEA Management Plan/ROD is expected to be completed by Fall of 2000.

Chapter 2 -
Affected Environment

Chapter 2 – Affected Environment

This chapter contains descriptions of existing physical, biological, cultural, social, and economic characteristics and resources of the Cascade Siskiyou Ecological Emphasis Area (CSEEA). Descriptions of these resources will serve as the baseline for the analysis and determination of the effects of the proposed alternatives on the existing environment. These resource descriptions are discussed only in the detail needed to analyze the known effects of the plan implementation. The affected environment is described according to the various resources, processes, and land locations in the CSEEA.

Land Ownership

The landscape being analyzed for the Cascade Siskiyou Ecological Emphasis Area covers 91,640 acres in Southwest Oregon and Northern California (map 1). The BLM-administered land within the proposed CSEEA analysis boundary is approximately 52,407 acres in Oregon and 4,522 acres in California (map 2). The BLM lands in Oregon are managed by the Medford District's Ashland Field Office while the California BLM lands are managed by the Redding Field Office. The remaining acres are owned by a mix of large and small land owners. Boise Cascade Corp. owns the largest amount of private land while U.S. Timberlands Inc. own large tracts. There are numerous small parcels on the west edge of the area, primarily along the I-5 corridor and the east fork of Cottonwood Creek in the Colestine area and along Oregon State Route 66 in the vicinity of the Greensprings/Lincoln/Pinehurst area.

Under the Medford District RMP, the majority of the area has been identified as Land Tenure Zone I, an area where public lands will generally be retained or private lands acquired to enhance resource values.

Ecological Processes and Landscape Health

The ecological and biological importance of the Cascade Siskiyou Ecological Emphasis Area has long been recognized (Carroll and others 1998, Detling 1961, Nelson 1997, Prevost and others 1990). The establishment of the CSEEA and its two ACECs and two RNAs recognize the high biological species and plant community richness of the area (ONHAC 1998, USDI-BLM 1995x).

Much of this richness is due to the CSEEA's geographical location at the meeting of the Cascade, Klamath and Eastern Cascade Slope Ecoregions (Pater and others 1997a) and their subdivisions, the Klamath River Ridges and Siskiyou Foothills (Klamath Ecoregion), Southern Cascades (Cascade Ecoregion), and the Southern Cascade Slope (Eastern Cascade Slope Ecoregion). Ecoregions should not be confused with Geological Provinces which are based strictly on geological criteria. Ecoregions are delineated on the basis of geology, climate, soils, flora and fauna, elevation, and land use. Each Ecoregion brings its own special assemblage of organisms and ecological processes to the CSEEA landscape.

Several recent papers describe unique aspects of the Klamath-Siskiyou region of northwestern California and southwestern Oregon to the west of the CSEEA. Della Sala and others (1999) describe the Klamath Siskiyou Bioregion (similar to an Ecoregion) as being of particular biological significance in terms of species richness, endemism, and unique evolutionary/ecological phenomenon, as compared to other temperate coniferous forests.

Coleman and Kruckeberg (1999) describe the dynamic plate tectonics of the Klamath-Siskiyous, and the mixing of igneous, metamorphic, and sedimentary geological formations that resulted in the diverse lithologies and soils of the Bioregion. Coupled with periods of geological isolation and a range of environmental conditions, the complex history of the area has resulted in a rich array of plant communities which has attracted the interest of ecologists of the caliber of Robert Whittaker, Richard Waring, Leroy Detling, and Arthur Kruckeberg as well as local nature lovers.

Of major importance is the role that the area proposed for the CSEEA played in contributing to the biological and ecological significance of the Klamath Ecoregion.

Landscape Criteria

Evolution, long term climatic change, geological phenomena (vulcanism, mass wasting, erosion) operating across geological time continue to contribute to the high biological and ecological richness of the area. However, the emerging science of landscape ecology identifies several landscape criteria, such as, connectivity and habitat fragmentation, that strongly effect the biological integrity of the CSEEA in the shorter term.

Many have commented (Carroll and others 1998, Della Sala and others 1999, Noss and Cooperrider 1994) of 'connectivity', implying the need to preserve and facilitate the habitat continuity necessary for the dissemination and longer term migration of rare plants, plant communities and wildlife dependent on late seral conifer communities. This document uses late seral conifer continuity as a substitute for the concept of connectivity. Spatial habitat requirement information for all organisms (rare or otherwise) across the landscape (implied by the definition of connectivity) is lacking. Conifer continuity implies present and potential habitat for conifer community dwelling organisms not adapted for long range dispersal (measured in miles), as coarsely identified by satellite imagery or potential vegetation based on USDA (1993) soil types. Regional satellite imagery shows the CSEEA the area of conifer continuity between the Cascade and Klamath ranges (and ecoregions) lies across the Siskiyou mountains north of the Rogue/Klamath Divide (map 4). However, the I-5 corridor, numerous roads, and timber harvest within and beyond the bounds of the proposed CSEEA boundary all represent disruptions in the late-seral conifer continuity. Dispersal habitat for spotted owls reflect this pattern (map 20). At the regional level, Late-Successional Reserves (LSRs) are designed to maintain late seral conifer continuity for regional spotted owl dispersion. This is discussed in greater detail within the wildlife section.

The original CSEEA boundary in the Medford District's Resource Management Plan includes a high elevation connectivity corridor jutting northwards for presumed high elevation conifer inhabiting organisms. This boundary does not assure east-west conifer continuity from the Cascades to the Klamath Mountains via the Siskiyous but only provides a north south corridor between Soda Mountain and the Greensprings summit.

Habitat Fragmentation - "the breakup of extensive habitats into small, isolated patches that are too limited to maintain their species stocks into the indefinite future" are an associated form of landscape degradation which could lead to species loss and favor weed invasion (Meffe and others, 1997). Rare plant surveys have identified threatened and endangered species within the CSEEA. Halpern and Spies (1995) studied species diversity in natural and managed forests of the Pacific Northwest. They found that few understory species were restricted to, or absent from, a particular seral stage. However, a majority of plant species showed greatest abundance in old-growth. Conversely, Jules et al (1999) found some plant and wildlife species more closely associated with particular seral stages, including clearcut areas and old-growth remnants. However, both groups favored the maintenance of spatial and temporal diversity for maintaining plant species diversity.

Ecosystem processes and interaction, patch size, frequency and severity of disturbance are all important criteria in characterizing disturbance. The altered nature of the CSEEA landscape is clearly indicated by recognizing that timber harvest, rather than fire, has become the dominant landscape-level disturbance process. High elevation white fir forest communities where root rots are the historical disturbance factor is the exception. The present frequency and patch size of timber harvests could be postulated to be similar to historical conditions caused by fire. Patterning and severity (except for white fir plant communities) are substantially changed. Present patterning follows landownership boundaries and remains rigid through time. Timber harvest layout tends to disregard topography and often are of similar size (Sections). Timber harvest on private and public land is frequently stand replacement with the removal of the larger older trees converse to historical underburns which left larger older trees.

Management objectives within the Jenny Creek Late-Successional Reserve (LSR) include facilitating and maintaining late seral conifer forest communities. However, the current checkerboard pattern of land ownership within the Jenny Creek LSR coupled with short harvest rotations on private land have interrupted late seral conifer continuity. Timber harvest on private lands frequently approximates a stand replacement event. Such events were probably not uncommon in mixed conifer communities in the recent historical past. During pre-European times, however, stand replacement by fire usually occurred as isolated patches within a larger area of underburns. At present, where fire escapes suppression, patch size is larger than during historical times, and fires are characterized as stand replacement rather than an underburn (Agee 1998). Fragmentation is greater now than during recent historical times. A greater portion of the landscape is currently acutely disturbed and edge effects and recovery times to attain mature trees have increased due to increased stand replacement events (clearcutting, and intense wildfire).

While little is known of the genetic variability within and between populations of isolated organisms, further fragmentation could be a threat to the continued persistence of isolated late-successional conifer organisms (Jules et al. 1999). Climatic edge effects may also impact the persistence of high canopy conifer community plant and wildlife inhabitants if patch size is too small. Ecologists commonly buffer disturbed areas by tens to hundreds of feet to correct disturbance edge effects on habitat availability of organisms adapted to conditions within the stand.

Map 5 illustrates the cumulative acute surface impacts on the landscape (woody overstory removal and altered ecosystem functioning by processes other than fire) derived from aerial photos (1939, 1953, 1974, 1996), known roads and OHV trail locations, and other areas altered relative to historical condition. All roads, OHV trails, areas of tree overstory removal, pasture creation, and known weed impact were buffered by 100 meters, as an average impact distance for the range of organisms found in our landscape. Table 2-1 indicates that all coarse plant communities have been severely impacted in the past 50 years.

Semi-wet meadows show the highest percent acute disturbance, while grasslands, shrublands, and woodlands show low acute disturbance (CSEEA plant communities are described in the Vegetation Section). The percentages in Table 2-1 are conservative estimates. Many conifer areas not showing acute disturbance in the past 50 years have been selectively logged. Also, the effects of long-term grazing and fire suppression were not included as acute disturbance. Note that the more highly fire-dependent grasslands, shrublands, and woodlands plant communities, are considered endangered and at highest risk of loss due to fire suppression. This discussion and Table 2-1 indicates that the CSEEA landscape is considerably altered when compared to historical conditions.

Table 2-1. Percentage Acute Disturbance for Plant Communities within Analysis Area	
Plant Community	**Percent Acute Disturbance**
Grassland	50.8
Shrubland	41.7
Woodland	45.2
Mixed Conifers	80.3
White Fir	81.6
Semi-wet meadows	90.5
Wet meadows	82.8

Calculation of the area covered by different plant communities across the CSEEA landscape indicate the relative importance of plant communities as refugia for plants and animals (see table 2-7). Some of the rarest plant communities (semi-wetlands and wetlands) have been the most severely impacted by historical livestock management within the CSEEA landscape. Wetlands and semi-wetlands are also of particular importance as specialized habitat and as a wildlife water source.

While much of this discussion implicates the spatial integrity of conifer plant communities, isolated stands of conifers embedded within other plant communities also serve an important ecological function across the landscape as stepping stones for more widely dispersed species. Such island habitats may also constitute areas of speciation, and contribute to the genetic diversity of organisms across the landscape. The CSEEA contains several such conifer islands on the southerly facing slopes south of Keene Creek Ridge and the Rogue/Klamath Divide moving from high elevation downwards towards the California border. While several of these stands have been impacted by timber harvest, all contribute to habitat diversity. These stands frequently have distinct tree assemblages, such as the old-growth mixed conifer stands with dominant sugar pine within the Oregon Gulch RNA. However, most of these isolated stands bear the consequences of fire suppression in the form of dense understories of Douglas-fir and white fir.

Other ecological processes that could be considered at the landscape scale, but are described at the community level of biological organization within this chapter, include changes in dominant species, species range extension/contraction, weed invasion, and tree pathogen proliferation.

Cultural Resources

Historic Use

Cultural resources include the physical remains of an area's past, as well as those areas which are significant for traditional cultural uses or spiritual practices. A region's cultural history is essential to understand and predict the cultural resources within it, and to define the human interactions with the land which have contributed to the condition of the current environment. Cultural resources in the CSEEA are managed under various federal laws and regulations, and by those management plans or actions that apply within it. Cultural resource laws also define the importance of tribal consultation when developing management plans that involve areas in which tribes have an interest. This section provides a brief cultural history as a background for the discussion of the cultural resources found within the CSEEA area, and discusses management concerns specifically pertinent to cultural resources.

Archaeological evidence indicates that people have lived in the region for at least 10,000 years. During that time people derived their material needs from the physical environment by hunting, gathering and fishing.

Human populations were very low in numbers and highly mobile until about 7,000 years ago. After that time populations increased in size, and regular camps appeared in the archaeological record. For the next 5,000 years the people of this region lived in small bands, moving themselves seasonally about the landscape in search of resources, in increasingly well-defined group territories. By 2,000 years ago, however, a new way of life was well-established.

The new way of life was characterized by larger populations, well-defined group territories, and a higher degree of sedentism than existed previously. Permanent villages, occupied annually for at least part of the year, appeared along the Klamath and along major tributaries to the Rogue River. Inhabitants of these villages still followed a seasonal regime, hunting and gathering in the uplands as game and resources became available. Populations continued to grow, and group interactions intensified, evident in an increase in regional trade and warfare. Social hierarchies developed, with wealth items representing higher status among individuals of families. This way of life continued until contact with Euro-Americans in the nineteenth century.

Various native peoples inhabited or used the proposed CSEEA area at the time of contact. The Shasta had numerous villages along the Klamath River north of the Shasta Valley, and also occupied the southern end of Bear Creek Valley in the Rogue River Basin. Members of the Klamath and Modoc tribes, situated mainly to the east in the Klamath Basin, may have used the eastern part of the proposed CSEEA (Agate Flat, Jenny Creek) for various purposes. The Takelma of the Rogue Valley may also have used the uplands in the northern part of the proposed CSEEA. All of these groups followed a traditional way of life in which relations to the natural world and to each other were encoded in myth and maintained by rituals, and for whom certain plants, animals, and places on the land had inherent spiritual qualities.

There were numerous resources upon which these native peoples depended. Roots and bulbs, such as camas (*Camassia*) and various forms of *Perideridia* (e.g. ipos, yampa) provided starchy staples as did acorns from oak trees. Fish, deer, elk, and small mammals provided staple proteins, augmented by a wide variety of berries, nuts, seeds (e.g. tarweed seeds, *Madia* spp.). Other plants and animals were used for fiber, tools, clothing, and medicines. Within the CSEEA, these resources were abundant along major streams, in the upland meadows, and especially in the flatter, more open areas in the east along Skookum Creek, Jenny Creek, and in Agate Flat.

Native peoples employed a number of techniques to enhance those resources useful to them. Fire was probably the most significant tool. Fire assisted in promoting and maintaining staple crops, such as acorns and tarweed, and maintained open meadows and prairies, which were crucial locations for subsistence resources including game, roots, bulbs, berry patches, and grass seeds. Fire also promoted habitat important to large game. Burning took place during the spring or fall and at specific intervals, and contributed to the development and maintenance of prairies and savannahs, oak and oak/pine woodlands, and upland meadows.

This native way of life was severely disrupted with the advent of Euro-Americans, beginning with Peter Skene Ogden's exploration in 1827. Ogden came from the east, following the Klamath River, then headed north over the Siskiyou mountains following an Indian trail into the Bear Creek valley. Ogden's trip, for the British Hudson's Bay Company, was the first of many to follow the north-south route over the Siskiyous. Known as the Oregon-California (O & C) or the Siskiyou Trail, this route was a major conduit of change to the region. Between about 1830 - 1850 numerous trappers, explorers, and others traveled along this route. They brought new people, practices, diseases, plants and animals through and to the region, as well as spreading fear and animosity among the area's current inhabitants.

Severe conflicts broke out in the 1850s between the Indians and the newcomers, with the discovery of gold and advent of thousands of miners and settlers to the region. During the 1850s and 1860s native peoples were largely removed from the CSEEA area. Many died from the warfare, disease, and starvation; others were captured and taken to reservations in the northern part of Oregon. The Klamath and Modoc Indians were confined to the Klamath Reservation east of the Cascades. Some Shasta families, however, managed to remain in the Shasta Valley and along the Klamath River, or escaped from the northern reservations to find their way home.

Settlement in the Rogue and Shasta valleys from the 1850s on spurred the development of a new way of life in the region. Farmers and ranchers began to transform the land. Newcomers built roads following the Siskiyou Trail and the Klamath River, and the Applegate trail east of Ashland. Irrigation works began to move water about the landscape. Hunters severely depleted local game, and brought local extinction to grizzlies, wolves, antelope, and mountain sheep. Recreational use of the area for hiking, hunting, and fishing also began around the turn of the century.

Cattle and sheep ranching became a significant use in the proposed CSEEA during the latter half of the nineteenth century. Ranches were established along the Klamath River corridor and its major tributaries, especially along Jenny Creek and Camp Creek, and along Bear Creek in Bear Valley. Like the native peoples before them, ranchers frequently burned the land to promote browse, and used the uplands seasonally for pasture. Grazing was unregulated, and by the early twentieth century many of the pastures and rangelands had been badly damaged from overgrazing, and indiscriminate burning--unlike the careful regime of the native peoples--had damaged timber resources as well.

The memoirs of George Wright provide a fascinating insight to past livestock management and plant community changes within the CSEEA. Two excerpts follow (for more refer to Appendix A).

> During the spring of 1889 and 1890 ... hundreds of cattle had just been loosed on the rangeland to graze the southward slopes of hillsides between Hornbrook and the Pilot Rock area ... (George F. Wright, The truth about Reelfoot p.4).
>
> Years ago there was a sheep camp during the summer months on the west side of Bald [Soda] Mountain ... The Bald Mountain area was a wonderful place for grass but the sheep men would herd their sheep there year after year until the grass was killed out. Weeds of different kinds have taken the place of the grass. About 1923 after the sheep had ruined the range, the cattlemen banded together and bought the sheep camp and the land, probably 160 acres. They also leased more land around there in order to keep the sheep men away. (Memoirs of George Wright, Bald Mountain, February 6, 1954 #614).

Logging became more important in the proposed CSEEA after the development of transportation routes, such as the railroad in the 1880s, and with the development of the orchard industry and its demand for wooden packing boxes. Small mills existed in the Ashland area and in the area around Lincoln east of Ashland. Major railroad logging operations existed east of the proposed CSEEA, with logs from the pine forests of the flat plateau chuted down to the Klamath River and floated to a mill at Klamathon. These early years of logging focused on the most accessible stands of timber, at lower elevations and on the high plateaus in the east, and on sugar pine. It was not until the middle of the twentieth century that developments in logging and transportation technology made logging of high elevation timber stands more feasible.

The advent of government management in the early decades of the twentieth century brought significant land management policies to the area proposed for the CSEEA. Game laws and regulations helped local game populations. Federal grazing regulations eventually helped slow the degradation of some upland areas, and begin the slow, gradual process of recovery. Fire suppression became a mission, and fire suppression policies began to transform the local vegetation patterns. A fire lookout was established on Soda Mountain in 1933.

Recreation continued to be important in the proposed CSEEA throughout the twentieth century. Today, the Pacific Crest National Scenic Trail runs north-south through the area, bringing many hikers through the area and passing by Pilot Rock. People still use the area seasonally to hunt and fish. More recent recreational use includes the use of off-highway vehicles (OHV), which allow individuals access to the area with a minimum of improved roads.

For more cultural history of the proposed CSEEA, refer to the cultural sections of the watershed analyses for the Klamath-Iron Gate and Upper Bear Creek area, and the Jenny Creek LSR assessment.

Archaeological Sites

Cultural resources include archaeological sites relating to the period of Native American habitation, historic era remains, and areas of traditional cultural importance such as spiritual sites or root gathering areas. There are numerous archaeological and historical sites in the CSEEA area.

Specific traditional use areas for Native Americans are as yet undefined. However, according to the traditional Klamath way of life, the value of various resources were integrated with each other and not seen as distinct. That is, the places where people lived or worked or camped--today's archaeological sites--were intimately connected with the distribution of plants and animals and views which gave sustenance and often spiritual meaning to the people who used the area. Hence, for the Klamath, the notion of "cultural resources" incorporates significant native plants, animals and viewsheds, as well as the remains of camps or task areas.

Traditional cultural plants and spiritual places, such as Pilot Rock, are also important to the Shasta tribe.

Native American Sites

Systematic archaeological surveys in the eastern half of the proposed CSEEA in Oregon (east of Soda Mountain) have located close to one hundred sites relating to native peoples' use of the area. Native peoples came to these areas to hunt and gather. None of these sites have been excavated or formally evaluated. Surface remains, however, suggest that most of these sites were related to seasonal use. These are areas where open meadows, oaks, and game still exist. Presumably, native peoples came to these areas to hunt and gather. The Agate Flat area also has an abundance of naturally occurring chert (cryptocrystalline silicate) which was an important stone used for tools. Many of the sites show signs of assaying and quarrying toolstone. Several Native American burial sites are also reported for this area (MDO cultural resource files). The Horseshoe Ranch Wildlife Area on lower Scotch in California Creek contains a Shasta village site.

Few systematic archeological surveys have been done in the western part of the proposed CSEEA. Nonetheless, several known sites are associated with the extensive system of upland meadows and springs west of Soda Mountain. Sites would also be expected to occur up the major drainage and also along the major ridgelines.

Historic Sites

Perhaps the most significant historic site in the proposed CSEEA is the remains of the Siskiyou Trail, which is still extant west of Interstate 5 just north of the California border. Rock alignments, blazed trees, and a scatter of artifacts such as cast-off ox shoes document this historic route. A project to further study, document, and retrieve historic materials along this route is slated for the spring of 2000.

Historic remains in the proposed CSEEA include a complex of structures at the Box-O Ranch, dating from the late nineteenth and early twentieth century, and including barns, sheds, a ranch house, irrigation ditches and a wagon road. Historic remains relating to the Horseshoe Ranch are recorded by the Redding BLM. Elsewhere in the CSEEA there are historic cabins that relate to the early ranching days, such as the Bean Cabin just west of Soda Mountain. Though no longer extant, the cabin's remains were studied to determine the original construction, so that the cabin might be rebuilt. Other historic remains include ditches, dumps, and structural remains generally related to the ranching history of this area.

Geology

The proposed CSEEA is primarily within the Cascade Mountain Range. The western edge of the CSEEA is a part of the much older Klamath Mountain geologic province. The Cascade Mountain Range is comprised of a wide variety of continental volcanic rocks. This volcanic province is divided into two distinct north-south belts: the older Western Cascades and the younger High Cascades(map 6).

The rocks of the Western Cascade Range began erupting around 40 million years ago, and stopped about 10 million years ago (Orr, Orr and Baldwin,1992). During this time the coast line in Oregon ran northwest through the region of the Willamette Valley. The volcanoes of the Western Cascade Range were created by the subduction of the Farallon plate beneath the North American crustal plate. This movement of enormous crustal plates, triggered intense volcanic activity.

The Western Cascades in this area are primarily composed of the Colestine and Little Butte Creek Formations. They are approximately 16,500 feet thick and form a stratigraphically complex sequence of continental volcanic, volcaniclastic and sedimentary rocks (Smith and others 1982). They vary from basalt, to basaltic andesite, to andesite. There are numerous tuffaceous, pyroclastic, and sedimentary interbeds. During this volcanism the region was subjected to many intrusions of mafic to felsic dikes, sills, plugs, and stocks. Hydrothermal alteration at the borders, and within these intrusive rocks is common.

One of the most striking features of the Western Cascades in this area is Pilot Rock, located near the southern boundary of the study area. It is a volcanic plug - the feeder vent to a now eroded volcano, it is an outstanding example of the "inside" of a volcano. Pilot Rock has shear, vertical faces up to four hundred feet above its base on a talus slope. It has classic columnar jointing caused by cooling of the hornblende andesite that makes up Pilot Rock (Purdom n.d.) .

Other notable geologic features with in the Western Cascades include Soda Mountain, Hobart Bluff, and Parsnip Lakes. Agate Flat is a unique flat table land toward the southeastern portion of the study area. This area has been a popular area for rock hounders to collect agate, jasper and petrified wood.

Erosion, assisted by subtropical climates, stripped the material from the volcanoes and redeposited it (Orr, Orr and Baldwin,1992). The drainage patterns in the area are deeply dissected and well-developed in response to landsliding and surface erosion.

There was a period of no volcanic activity in the region from about 4 to 5 million years ago. It was during this time that the Western Cascade Range was uplifted, tilted eastward, and further eroded. These rocks form an east to northeast dipping homoclinal sequence with dips ranging from 5 to 30 degrees (Smith, 1982).

The CSEEA area north of Highway 66 and the eastern boundary are made up mostly of the High Cascade Range. This range, which started erupting about 4 million years ago and continues at present, virtually buried the severely eroded Western Cascades. The first eruptions of the High Cascades were shield volcanoes and cinder cones. Later, the High Cascades produced a variety of lavas and tuffs, dominated by basalts, which were erupted from a number of composite cones (Orr, Orr and Baldwin,1992).

Jenny Creek roughly follows the contact of the High Cascades and the Western Cascades. Chinquapin Mountain and Little Chinquapin Mountain are a part of the High Cascades. These younger High Cascade volcanoes are responsible for the present day topography of the range, including Crater Lake and the high peak of Mt. McLoughlin.

A unique feature of the proposed CSEEA is the proximity of the Klamath Mountains to the Cascade Range. The geology of the southwestern area of the CSEEA is a part of these much older rocks. The Klamath Mountains are made up of seven different exotic terranes that were once parts of the ocean crust or island archipelago environments. Formed in an ocean setting, these tectonic slices were carried toward the North American land mass, via plate tectonics. Upon arrival they were accreted to the existing continent, folded and faulted.

The Klamath Mountains were later intruded by granitic rocks (Orr, Orr and Baldwin,1992). One of these intrusions is the granitoid Ashland Pluton, which is age dated at 167 to 148 million years old (D'Allura 1997). Mt. Ashland Pluton is overlain non-conformably by the late Cretaceous Hornbrook Formation.

The Cretaceous Hornbrook Formation (135 to 65 million years) is one of the youngest formations within the Klamath Mountains. It is sedimentary sands, muds, silts and volcanic material. Well preserved bottom dwelling clams, snails and cephalopods can be found. They represent shallow water continental shelf conditions.

The much older Klamath Mountains are adjacent to the Cascade Range near the Siskiyou Summit area. At one time, the Bear Creek Valley and the Colestine Valley were joined but, over time, the Siskiyou Summit fault was uplifted and created a pass where the valley once was. The Siskiyou Summit fault is one of the most significant faults in Oregon and has moved thousands of feet (M. Elliot, Geology, S Or Univr, pers communication, 1991). At the Siskiyou Pass area these two geologically distinct mountain ranges meet.

The Colestine Formation is at the base of the Western Cascades. This formation contains ash flow tuff, some of which contain fossil leaves, cones, and plant fragments. Some of these fossiliferous out crops are near Pilot Rock. When this rock was being deposited the region was lower in elevation that it is today and considerably warmer. The beautifully preserved Oligocene plant fossils of metasequoia, sycamore, ferns and more are found with in this fine grained, white tuff (Orr 1981).

Agate Flat is also within the Western Cascade volcanics. It is a unique flat table land toward the southeastern portion of the study area. This area has been a popular area for rock hounders to collect agate, jasper and petrified wood.

Soils

Soils vary in the Cascade Siskiyou Ecological Emphasis Ares (CSEEA) with land form and source material. The topography is variable in the proposed CSEEA with the area around Agate Flat being nearly level to slopes in excess of seventy percent along the head walls of Scotch Creek, Camp Creek and Dutch Oven Creek. Elevation ranges from 2,375 feet at the mouth of the watershed to 6,091 feet at the top of Soda Mountain. Average annual precipitation for this area ranges from 20 to 40 inches with most coming in the form of rain below 3,500 feet and snow about that level.

Most of the soils were formed in alluvium or colluvium from hard volcanic rocks and, as a result, are often shallow or have a high rock content that affects their water holding capacity (map 7). The volcanic parent material has also influenced the mineralogy of the soil as a large proportion (52%) of the soils in the proposed CSEEA have montmorillonitic clay mineralogy. Soils with montmorillonitic clays have a high shrink/swell ratio which results in large cracks in the soil when it is dry and swelling upon wetting. These soils are very sticky and slippery when wet and have potential for movement at steeper slopes. Mechanical damage to soils containing montmorillonitic clays are difficult to ameliorate especially the soils with high rock content. Refer to map 8 for location of soils with montmorillonitic mineralogy in the CSEEA.

Soils on wet alluvial margins and meadows are typically Klamath (99) and Sibannic (167). These very deep, poorly drained fragile soils are frequently flooded for long periods between March and May. As a result, rooting depth is usually limited by a water table from March through June. The location of these and other fragile soils in the proposed CSEEA are shown on map 9.

The major soils series on the Western Cascades hill slopes are typically McMullin (113), McNull (114), Skookum (173), and Tatouche (190). These are well drained, moderately deep to deep soils with clayey subsoils (with varying amounts of coarse fragments) except for McMullin, which is a shallow and loamy soil. Soil patterns and landscape in this part of the area are very complex due to differing degrees of weathering of the mixed basalt/tuff/breccia of the Western Cascade material. Soils with clayey subsoils have low strength when wet, while sediments derived from these soils are fine and is suspended in solution (water) for extended periods of time. As a result, these soil types are also susceptible to cutbank failures and turbid runoff.

Soil series in the Agate flat area are Carney (27) and Randcore/Shoat complex (152). The Carney soil series is moderately deep and consist of montmorillonitic clay. The Randcore/Shoat complex consist of a shallow, extremely stony loam soil in association a moderately deep, loamy soil. This complex occurs as patterned land on the landscape. Soils in the Agate Flat area on alluvial fans ranging in slopes from 12 to 20 percent are the Farva (58), which is a moderately deep, cobbly loam soil, and Tatouche (190) which is a deep, gravelly clay loam over a clay. All of these soils except for Tatouche has soil moisture limitations as a result of depth, rock content, or heavy clay. Refer to the General Soils map (map 10) for location of these soils on the landscape and see Appendix B for characteristics of the identified soils. Also refer to the *Soil Survey of Jackson County* (USDA 1993) for soil descriptions, interpretations and more detailed mapping.

Most of the soils in this area exhibit erosion rates near natural levels except where recent harvesting has occurred or roads have been built. Generally, these areas will have erosion rates noticeably above natural levels for the first three to five years after a disturbance. Natural surface roads and/or roads not maintained often erode above natural rates as a result of being poorly drained or rutted from use during the wet season. Refer to the transportation section for the amount and condition of roads in the proposed CSEEA.

Most of the soils in the CSEEA are productive but many have limitations of high rock content and/or a perched water table (in the spring time). Soils along ridge lines tend to be shallow which limits water holding capacity. Tree species and grass compete for water and minerals in disturbed forest stands. When stands open during tree harvest more sunlight reaches the ground and, as a result, grass species can invade the site. This often affects the types and numbers of soil microbial populations and their ability to synthesize organic material into nutrients available for plant growth. The microbial population of a grass dominated soil is predominantly of bacteria, while an old-growth forest is predominantly of fungi. A fungal dominated soil is more conducive to tree growth, as ectomycorrhizal fungi aid trees by mediating nutrients and water uptake, protecting against pathogens and maintaining soil structure.

Coarse Woody Debris and Soil Health

Large materials (e.g., coarse woody debris, stems, large branches) are important for healthy soil biology. Woody materials influence soil nutrient availability, soil moisture, and soil organism population levels. Soil organisms play a fundamental role in many site processes because they interact with each other and their environment. Soil organisms promote carbon cycling, nutrient transfer, water availability, vegetation vigor, and maintain soil structure. Most biological nitrogen fixation in ecosystems occurs because of soil organism activity. Mycorrhizal fungi increase the absorbing surface area of roots, which directly increases the total soil volume that can be utilized for nutrients and water. Mycorrhizal fungi and other microbes effect soil structure by helping bind soil particles into water-stable aggregates which create soil volume with stable and adequate pore space. Soil pore space is essential for adequate water and air movement required by plants and soil organisms. Many forest dwelling plant and animal species depend on soil organisms and/or fungi for food sources.

Coarse woody debris (CWD) information was collected in four ecoregions of the Jenny Creek LSR (map 11). Sampling was conducted on five sites along transects in each of the respective ecoregions except for the Southern Cascade Slopes which only had one site. These sampling sites were located in Spotted Owl core areas which represents undisturbed or lightly disturbed timber stands. These sampling sites provide current status of coarse woody debris in these mature stands. Table 2-2 displays the amount of coarse woody debris that is 16 inches in diameter and at least 16 feet in length in decay class 1 or 2 (NWFP/ROD definition). Table 2-2 also indicates current status of snags available for future coarse wood recruitment. Target levels for coarse wood in the respective ecoregions were devised based on current information. Target densities apply to all forested stands across the CSEEA in these respective ecoregion. CWD target densities for land outside of these ecoregions should be consistent with the Northwest Forest Plan Standards and Guidelines.

Target densities for the Southern Cascade Slopes ecoregion (along Jenny Creek), should be the same as the nearby Klamath River Ridges ecoregion for similar plant associations at similar elevations. Direct calculations were not possible of this ecoregion because of the single transect.

Table 2-2. Coarse Woody Debris Observations and Targets by Ecoregion in CSEEA

Ecoregion	Coarse Wood on ground 16"dia./16'+ in decay class 1 or 2 (Ave. # pieces/acre)	Standing snags 16"dia./16'+ (Ave. per acre)	Coarse Wood target density for decay class 1 or 2 (Ave. # pieces/acre)
Siskiyou Foothills	1.4	1.9	2
Klamath River Ridge	5.2	6.9	5
South Cascades	4.2	7.2	4

Hydrology

The CSEEA is located in two river basins and four watersheds. Table 2-3 and Map 12 display the hydrologic units that fall partially or completely within the CSEEA.

There are two natural lakes in the planning area and they are partially on BLM-administered land: Hobart Lake in the Upper Emigrant Creek Subwatershed and Parsnip Lakes in the Keene Creek Subwatershed. Only a portion of Hyatt Lake, one of two major water reservoir in the area, is located in the proposed CSEEA. It and Howard Prairie Lake are managed by the Bureau of Reclamation and the Talent Irrigation District primarily for irrigation in the Bear Creek Watershed, some hydroelectric production and recreational opportunities.

There are numerous springs in the planning area. Their locations are shown on U.S. Geological Survey (USGS) topographic maps. Wetlands inventoried by the U.S. Fish and Wildlife Service (USFWS) are displayed on the USFWS wetland maps available on the USFWS Internet site. Mapped wetland locations in the Klamath-Iron Gate Watershed and Upper Bear Creek Analysis Area may be found in the corresponding watershed analysis documents.

There are no continuous streamflow-monitoring stations on non-flow regulated (natural flowing) streams within the proposed CSEEA. The BLM installed a gaging station on Jenny Creek downstream of the Box-O Ranch in the fall of 1997 and it became fully operational in the fall of 1999. Unregulated streamflow in the planning area fluctuates with seasonal variation of precipitation. Moderate to high flows generally occur from mid-November through May. Streamflows during the months of March, April, May, and part of June are augmented by melting snowpack in the high elevations. Low flows normally coincide with the period of low precipitation from July through October.

Peak streamflows in the proposed CSEEA are the result of a combination of natural and human-caused factors. Natural factors contributing to peak flows include high intensity storms, snow melt, rain-on-snow events, and severe, extensive wildfires. Human influences that might increase peak flow magnitudes above natural conditions include road construction, timber harvest, land clearing, and reservoirs. High road densities that may increase peak flow magnitudes are a concern in portions of the planning area within Jenny Creek and Bear Creek Watersheds. Timber harvest and land clearing in the Jenny Creek and Bear Creek Watersheds have decreased canopy closure and increased transient snow zone openings to an extent that they are likely to contribute to increased peak flow magnitudes in some drainages. Direct interception of precipitation by the reservoir surfaces in the Jenny Creek Watershed result in instant delivery of precipitation into the stream system which affects the timing and magnitude of peak flows.

Table 2-3. Hydrologic Units within the CSEEA

Hydrologic Units	Hydrologic Unit Code[1] (HUC)	Acres within CSEEA[2]		Stream Miles within CSEEA[3]	
		BLM	Total	BLM	Total
Klamath River Basin	180102				
Upper Klamath Sub-basin	18010206	50,914	78,946	355.8	537.2
Jenny Creek Watershed	1801020603	29,517	46,958	164.4	272.1
Upper Jenny Creek Subwatershed	180102060301	2,425	3,071	11.4	13.6
Johnson Creek Subwatershed	180102060303	440	445	2.7	2.7
Middle Jenny Creek Subwatershed	180102060304	6,283	14,355	27.5	76.3
Keene Creek Subwatershed	180102060305	9,305	16,121	52.7	97.9
Lower Jenny Creek Subwatershed	180102060306	11,066	12,966	70.1	81.6
Klamath-Iron Gate Watershed	1801020604	15,379	20,255	147.5	189.5
Fall Creek Subwatershed	180102060401	49	49	0.0	0.0
Camp Creek Subwatershed	180102060402	8,198	8,974	76.9	81.4
Scotch Creek Subwatershed	180102060403	7,103	10,803	70.5	105.3
Iron Gate Subwatershed	180102060404	29	429	0.1	2.8
Bogus-Willow Watershed	1801020605	538	1,387	2.5	3.4
Brush/Little Bogus Subwatershed	180102060502	538	1,387	2.5	3.4
Cottonwood Creek Watershed	1801020606	5,480	10,346	41.4	72.2
Upper Cottonwood Creek Subwatershed	180102060601	2,377	6,719	16.0	42.3
Lower Cottonwood Creek Subwatershed	180102060602	3,103	3,627	25.4	29.9
Rogue River Basin[4]					
Middle Rogue Sub-basin	17100308	6,014	12,695	40.4	97.8

Table 2-3. Hydrologic Units within the CSEEA

Hydrologic Units	Hydrologic Unit Code[1] (HUC)	Acres within CSEEA[2]		Stream Miles within CSEEA[3]	
		BLM	Total	BLM	Total
Bear Creek Watershed	1710030801	6,014	12,695	40.4	97.8
Upper Emigrant Creek Subwatershed	171003080101	6,014	12,695	40.4	97.8

1/ Hydrologic Unit Code is a unique identifier for each hydrologic unit. The first eight digits are designated by the U.S. Geological Society.
2/ Acres within CSEEA analyzed using Alternative D boundaries.
3/ Stream miles are from the BLM GIS Hydrography Theme prior to completion of the spatial densification.
4/ Rogue River Basin does not have its own HUC as it is within the Southern Oregon Coastal HUC 171003.

Augmentation and diversion of flows in the Jenny Creek Watershed for purposes of irrigation in the Bear Creek Watershed greatly complicate the instream flow regime for Jenny and Keene Creeks within the planning area. Water diversions from Hyatt and Howard Prairie Reservoirs, from Soda and Beaver Creeks by Talent Irrigation District (TID), and from Shoat Springs Creek by Pacificorp export approximately 30,000 acre feet of water annually from the Jenny Creek Basin (Bessey, 1988). This quantity represents 28 percent of the estimated total runoff that would otherwise be available to support the basin's fish populations. Reservoirs in the Jenny Creek watershed are not managed for flood control and consequently, the reservoirs may reach full pool early in the water year. Peak flows may approximate pre-dam conditions when surplus reservoir water enters the stream system.

Low flows in Jenny and Keene Creeks are dramatically reduced due to diversion at the reservoirs and to a lesser extent by other water withdrawals for use within the Jenny Creek Watershed. BLM, in cooperation with Oregon Water Trust, has made application with the Oregon Water Resources Department to transfer the irrigation water rights for the Box-O Ranch to in-stream use for the benefit aquatic resources.

Surface water rights in the CSEEA portion of the Klamath-Iron Gate Watershed total 4.0 cfs for irrigation out of Scotch Creek and 0.01 cfs out of Camp Creek for domestic use (table 22, Klamath-Iron Gate Watershed Analysis 2000a). The lower reaches of Scotch, Camp, and Cottonwood Creeks are often dry by mid-to-late summer due to lack of precipitation in the first two creeks and irrigation withdrawal in Cottonwood Creek. Water uses and low flow conditions in the CSEEA portion of the Cottonwood Creek Watershed are unknown.

The Oregon Water Resources Department (OWRD) is currently conducting an Oregon general stream adjudication in the Klamath River Basin. Adjudication is the Oregon statutory process for quantification and documentation of all rights to water, the use of which was initiated before February 24, 1909, and federal reserved water rights, including the rights of Indian tribes and their members. The Klamath Adjudication is the first Oregon general stream adjudication in which complex federal claims have been filed. The BLM has filed claims for federal reserved water rights for springs in the planning area. The OWRD initiated a voluntary dispute resolution process in 1997 to provide a forum to address adjudication claim issues and other matters related to water supply and demand in the Klamath River Basin. The OWRD completed the claim review in August 1999 and is currently conducting an open inspection of claims.

There are 14 diversion points within the proposed CSEEA portion of the Bear Creek Watershed. Water uses are primarily for irrigation, agriculture, and domestic purposes. (UBCWA, Water Right Diversions Map). Streamflows in the upper portions of Baldy and Green Mountain Creeks tend to dry up by late summer, however, the lower reaches are perennial. Main stems of Emigrant, Tyler, and Porcupine Creeks are perennial on BLM-administered lands.

Water Quality

The 1957 Klamath River Basin Compact between Oregon and California recognizes the following designated uses for the Jenny Creek, Klamath-Iron Gate, and Cottonwood Creek Watersheds: domestic water supply; livestock watering; irrigation; protection and enhancement of fish, wildlife and recreational resources; industrial; hydroelectric power production; navigation; and flood prevention (OWRD 1997). The Oregon Department of Environmental Quality (ODEQ) has designated the following uses for the Bear Creek Watershed: domestic water supply (municipal and private), industrial water supply, irrigation, livestock watering, anadromous fish passage, salmonid fish rearing, salmonid fish spawning, resident fish and aquatic life, wildlife and hunting, fishing, boating, water contact recreation, aesthetics quality, and hydro-power (ODEQ 1992). The designated uses are important because they determine the water quality criteria that will be applied to that water body. Water quality standards are typically designed to protect the most sensitive beneficial uses within a water body. The most sensitive beneficial uses for the planning area are the protection and enhancement of fish resources, salmonid fish rearing and spawning, and domestic water supply. Temperature, dissolved oxygen, bacteria/pathogens, turbidity, and sedimentation are the key water quality indicators most critical to these sensitive beneficial uses.

Section 303(d) of the Clean Water Act requires each state to identify streams, rivers, and lakes that do not meet water quality standards even after the implementation of technology-based controls. These waters are referred to as "water quality limited" and states are required to submit 303(d) lists to the Environmental Protection Agency every two years. Water quality limited waters require the application of total maximum daily loads (TMDLs) which is a strategy for improving water quality to the point where recognized beneficial uses of the waters are fully supported. A TMDL addresses pollution problems by identifying those problems, linking them to watershed characteristics and management practices, establishing objectives for water quality improvement, and identifying and implementing new or altered management measures designed to achieve those objectives (ODEQ 1997). Water Quality Management Plans (WQMPs) to address nonpoint sources and TMDLs will be prepared for each watershed included in the planning area starting in 1999 and scheduled for completion by 2004.

The Oregon DEQ's 1998 list of water quality limited streams includes streams within the proposed CSEEA (table 2-4). No streams in the Klamath-Iron Gate Watershed or Cottonwood Creek Watershed portions of the planning area are on the Oregon or California State 303(d) lists.

The DEQ's 1988 Oregon Statewide Assessment of Nonpoint Sources of Water Pollution (NPS Assessment) identifies two stream segments and one reservoir in the planning area that are impacted by nonpoint source pollution. Table 2-5 identifies affected water body segments and table 2-6 lists the probable causes and associated land uses.

Water Temperature

The Oregon State water quality criteria for temperature is established to protect resident fish and aquatic life, and salmonid fish spawning and rearing. The temperature standard for summer temperatures in the Rogue and Klamath Basins was revised in

Table 2-4. Water Quality Limited Streams on the 303(d) List

Watershed	Stream Name	Description	Parameter
Jenny Creek	Beaver Creek	Mouth to Talent Irrigation District Ditch	Temperature - summer
	Corral Creek	Mouth to Talent Irrigation District Ditch	Temperature - summer
	Jenny Creek	Mouth to Grizzly Creek	Temperature - summer
	Johnson Creek	Mouth to headwaters	Temperature - summer
	Keene Creek	Mouth to Little Hyatt Reservoir	Temperature - summer
	South Fork Keene Creek	Mouth to headwaters	Temperature - summer
	Lincoln Creek	Mouth to headwaters	Temperature - summer
	Mill Creek	Mouth to headwaters	Temperature - summer
Bear Creek	Baldy Creek	Mouth to headwaters	Temperature - summer
	Carter Creek	Mouth to headwaters	Temperature - summer
	Emigrant Creek	Mouth to Emigrant Reservoir	Nutrients (TMDL approved 12/92) Temperature - summer
	Emigrant Creek	Emigrant Reservoir to Green Mountain Creek	Temperature - summer
	Hobart Creek	Mouth to headwaters	Temperature - summer
	Tyler Creek	Mouth to headwaters	Temperature - summer
	Walker Creek	Mouth to headwaters	Temperature - summer

Source: ODEQ 1998

January 1996. The standard now states that the seven day moving average of the daily maximum shall not exceed 64°F. Streams in the planning area that exceed the temperature standard are listed in table 2-4 as water quality limited.

Both natural and human-caused factors contribute to elevated stream temperatures in the planning area. Natural factors that affect stream temperature in the proposed CSEEA include: below normal precipitation and subsequent low summer streamflows, hot summer air temperatures, stream orientation, low gradient valley bottoms, and wildfires and floods that result in the loss of riparian vegetation. Human-caused disturbances that are likely to have resulted in increased summer stream temperatures include water withdrawals, channel alterations that have increased the width-to-depth ratio, and riparian vegetation removal through logging, road building, livestock grazing, or residential clearing.

Available stream temperature monitoring data for the planning area may be found in Appendix U, the Klamath-Iron Gate Watershed Analysis, and the Upper Bear Creek Watershed Analysis (USDI, 2000b).

Table 2-5. Water bodies included in DEQ's NPS Assessment				
Watershed	**Stream Name**	**DEQ Segment ID**	**Segment Location**	**Parameter of Concern**
Jenny Creek	Hyatt Lake	337	Reservoir	Pesticides Excessive plant growth
	Jenny Creek	11	Oregon/California border to Howard Prairie Reservoir	Sedimentation
Bear Creek	Emigrant Creek	286	Emigrant Reservoir to headwaters	Flow modification Sedimentation

Source: ODEQ 1988

Table 2-6. Probable Causes and Land Use Associated with Nonpoint Source Pollution		
DEQ Segment ID[1]	**Probable Cause of Nonpoint Source Pollution**	**Land Use Associated with Nonpoint Source Pollution**
337	None identified	None identified
11	Streambank erosion and elimination of thermal cover	Harvesting and road construction
286	Surface erosion and water withdrawal	Irrigated cropland/pastureland

Source: ODEQ 1988

1/ See table 2-5 for segment location.

Dissolved oxygen

Dissolved oxygen concentration refers to the amount of oxygen dissolved in water. Dissolved oxygen is critical to the biological community in the stream and to the breakdown of organic material (MacDonald et al. 1991). Dissolved oxygen concentrations are primarily related to water temperature; when water temperatures increase, oxygen concentrations decrease. (MacDonald et al. 1991).

Oregon's dissolved oxygen standard was revised in January 1996. The new standard describes the minimum amount of dissolved oxygen required for different water bodies (i.e., waters that support salmonid spawning until fry emergence from the gravels, waters providing cold water aquatic resources, waters providing cool-water aquatic resources, etc.) (ODEQ, 1998). California's dissolved oxygen standard for the planning area streams within the Klamath-Iron Gate Watershed have a 50 percent lower limit of 9.0 mg/l (which means that 50 percent or more of the monthly means must be greater than or equal to 9.0 mg/l), with a minimum value of 7.0 mg/l (CRWQCB, 1997).

Dissolved oxygen data is not available for the planning area, although it is likely to be a concern in streams with high temperatures.

Water Bacteria/Pathogens

Waterborne pathogens include bacteria, viruses, protozoa, and other microbes that can cause skin and respiratory ailments, gastroenteritis, and other illnesses. Most drinking and recreational waters are routinely tested for certain bacteria that have been correlated with human health risk. If the average concentration of these bacteria falls below the designated standard, it is assumed that the water is safe for that use and that there are no other pathogenic bacteria that represent a significant hazard to human health (MacDonald et al. 1991). The four groups of bacteria most commonly monitored are total coliforms, fecal coliforms, fecal streptococci, and enterococci. Fecal coliform bacteria are mostly those coliform bacteria that are present in the gut and feces of warm-blooded animals. They can be directly linked to sanitary water quality and human health risks.

Oregon's water quality criterion for bacteria states that for a 30-day log mean of 126 *Escherichia coli* (a species of fecal coliform) organisms per 100 ml, based on a minimum of five samples, no single sample shall exceed 406 *E. coli* organisms per 100 ml (ODEQ, 1998). California's bacteria criterion states that the bacteriological quality shall not be degraded beyond natural background levels. In waters designated for contact recreation, the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml (CRWQCB, 1997). The purpose of the bacterial water quality standard is to protect the most sensitive designated beneficial use, which has been identified as water contact recreation.

No bacteria/pathogen data is available for the streams within the planning area.

Water Turbidity and Sedimentation

Sedimentation is the natural process of sediment entering a stream channel. However, excessive fine sediments (sand-size and smaller) can cause problems such as turbidity (the presence of suspended solids) or embeddedness (buried gravels and cobbles). Sedimentation is generally associated with storm runoff and is highest during fall and winter.

Oregon's standard for sedimentation states that "the formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, reaction, or industry shall not be allowed" (ODEQ, 1998). Oregon's standard for turbidity states that "no more than ten percent cumulative increase in natural stream turbidity shall be allowed, as measured relative to a control point immediately upstream of the turbidity causing activities" (ODEQ, 1998). The California water quality objective for sediment states that "the suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses" (CRWQCB, 1997). California's turbidity objective states that "turbidity shall not be increased more than 20 percent above naturally occurring background levels" (CRWQCB, 1997).

No streams in the planning area are on the 303(d) list for sedimentation, however, Jenny Creek and Emigrant Creek are identified by Oregon DEQ as having sedimentation as a parameter of concern (see table 2-5).

Natural processes occurring in the proposed CSEEA such as surface erosion, mass wasting, wildfire, and flood events contribute to increased sedimentation. Accelerated rates of upland erosion in the planning area are primarily caused by road building and logging. Older roads with poor locations, inadequate drainage control and maintenance, and no surfacing are more likely to erode and cause the sedimentation of stream habitats. The Schoheim Road (41-2E-10.1) in the Klamath-Iron Gate Watershed has become notorious because of its poor condition and its sediment contribution to stream channels. Although approximately eight miles of this road had drainage improvements in the fall of 1998, there are still approximately 11 miles that are in need of maintenance or decommissioning. The erosion problems on the unmaintained portion of Schoheim road are due to inadequate drainage and maintenance that is exacerbated by vehicle and OHV use (Salix Applied Earthcare, 1998). The Salix Applied Earthcare report initiated road maintenance activity. Logging practices such as clearcut logging, logging in unstable areas, and using tractors on steep slopes contribute to increases in over natural sedimentation rates. The effects of logging practices on stream sedimentation are primarily a concern in the Jenny Creek, Bear Creek, and the east fork of Camp Creek Watersheds of the CSEEA, where logging has been most prevalent. Logging in unstable areas has likely accelerated several hillslope failures in the Bear Creek Watershed portion of the planning area.

Human-caused disturbances in the planning area that accelerate stream bank erosion include stream channelization and stream-adjacent land clearing, concentrated livestock grazing, and road building. Past stream channelization is a major factor contributing to stream bank erosion in portions of Jenny Creek. Poorly managed livestock grazing in the late 1800s and early 1900s throughout the planning area was likely a significant cause of stream bank damage and subsequent sedimentation. Stream bank damage resulting from concentrated livestock grazing continues to be a concern for some stream reaches in the Jenny Creek and Klamath-Iron Gate Watersheds (USDI 1995b, p36, and USDI 2000a, Current Conditions, Water Quality). There are many stream-adjacent roads throughout the planning area that confine stream channels and restrict the natural tendency of streams to move laterally. This can lead to downcutting of the stream bed or erosion of the streambanks. Stream-adjacent roads are also a direct source of sediment to adjacent stream reaches.

Irrigation ditch failures, poor irrigation practices, and off-highway vehicle use, also result in increased human-caused stream sedimentation. The Talent Irrigation District's delivery canal in the Jenny Creek Watershed has had several failures that resulted in large amounts of sediment going directly into Jenny Creek (USDI 1995b, p 36). Off-highway vehicle use that results in stream sedimentation is a concern in localized areas throughout the planning area.

Winter season turbidity data for Jenny Creek at the Box-O Ranch is shown in Appendix U. No winter season turbidity data is available for other streams within the CSEEA.

Aquatic Resources, Stream Channels, and Riparian Habitat

Portions of Jenny Creek, Bear Creek, Klamath/Iron Gate and Cottonwood Creek watersheds are included in the CSEEA planning area. Map 13 shows CSEEA stream systems, widths of Riparian Reserves, and known fish distribution in the four watersheds. Existing conditions for aquatic resources, stream channels, and riparian habitat is discussed by watershed in the text below. Refer to table 2-3 for data concerning stream miles and acres included for each watershed.

Jenny Creek Watershed

The Jenny Creek watershed is a very complex system with regard to hydrologic characterization. Characterization is based on climatological, hydrologic and physical data such as soils, elevation, slopes, and areas. The watershed spans an area of 134,300 acres or 210-square miles [Jenny Creek Watershed Assessment and Analysis (USDI 1995b)]. Those portions of the watershed, influenced by management within the proposed CSEEA planning area, cover approximately half of that area. Elevation ranges from 2,375 feet at the mouth of the watershed to 6,091 feet at the top of Soda Mountain. Over 960 acres of stream corridor have been classified as Jenny Creek Area of Critical Environmental Concern (ACEC). The watershed contains six distinct subwatersheds: Upper Jenny Creek, Sheepy Creek, Johnson Creek, Middle Jenny Creek, Lower Jenny Creek, and Keene Creek. Only portions of Upper Jenny Creek, Middle Jenny Creek, Lower Jenny Creek, and portions of Keene Creek are associated with the planning area. [These four subwatersheds are discussed in detail in the JCWAA (USDI 1995b).] The planning area includes the main stem of Jenny Creek south of Howard Prairie Reservoir and its tributaries, excluding the Johnson Creek drainage, south to the Oregon/California border. In California, the planning area includes the 400 acre Jenny Creek ACEC which was established under the Redding BLM District Resource Management Plan.

Aquatic Resources

The Jenny Creek Watershed is host to a number of endemic fish and macroinvertebrates. There are also a number of introduced fish, primarily in headwater reservoirs.

Fish

Jenny Creek supports three endemic fish, the Jenny Creek sucker, the redband trout, and the Klamath speckled dace. The sucker and trout are on the BLM's list of special status species. Both fish are isolated above two impassable waterfalls located about one mile south of the Oregon/California border. The falls are estimated to be roughly five million years old (Hohler 1981), however, the fish are presumed to date back only to the end of the ice age when extensive flooding may have allowed native populations in some headwater streams to transfer to others. This "headwater capturing" may be responsible for the presence of Klamath small-scaled suckers (*Catostomus rimiculus*) in Jenny Creek and the Rogue River. The redband trout (*Onchorhynchus mykiss sp.*) may also have originated from another Klamath Basin headwater stream through the same process. The Klamath speckled dace (*Rhinichthys osculus*) is more widely spread throughout much of the Klamath River Basin.

Redband Trout

The Jenny Creek race of the Redband Trout, a subspecies of the Rainbow Trout (*Onchorhynchus mykiss*) is distributed throughout the Jenny Creek watershed from the lower falls to the Howard Prairie Dam and in all the major tributaries. Keene Creek is an especially important nursery stream (J Rossa, Medford BLM, pers comm 1998). The redband commonly reaches a length in excess of ten inches, consequently it is popular among stream anglers.

This trout caused some confusion as to its genetic make-up for a number of years, then in 1990 Kenneth Currens, a Graduate Research Assistant with the Oregon Cooperative Wildlife Research Unit at Oregon State University, undertook an electrophoretic study. Currens' analysis found that the Jenny Creek trout showed no identifying features to cutthroat or to coastal rainbow stocks, but has some similarities to other headwater rainbow stocks found elsewhere in the Klamath Basin. These fish need further taxonomic investigation, but until that happens the fish has been lumped into a broad group of unique rainbow called "redband."

Jenny Creek Sucker

The Jenny Creek sucker is a dwarf form of the Klamath small-scaled sucker. It matures at age two at around 130 mm (five inches) and seldom exceeds 210 mm (8.5 inches). It is the only dwarf sucker found in the northwest (Hohler 1981). Its distribution in Jenny Creek extends from the falls at river mile (R.M.) 2 to R.M. 28, and it occurs in four of the major tributaries. The upstream limit for the fish on Jenny Creek is in Township 39 South, Range 4 East, Section 10, approximately 0.3 mile below the confluence of Jenny and Grizzly Creeks. Approximately 28 percent (8 miles) of the species habitat passes through lands administered by the Medford District (Bessey 1988).

David Hohler, OSU, studied the distribution and size at maturity of this fish in 1988. Then in 1993, Phil Harris, OSU, conducted an electrophoretic study of the taxa with samples coming from Jenny Creek, the Klamath River and the Rogue River. Harris concluded that there is a genetic difference between Rogue River stock and samples from the other two streams, but that there is little genetic difference between suckers in Jenny Creek and those in the lower Klamath River. Harris did note, however, "we believe that Jenny Creek suckers meet the criteria for consideration as an evolutionarily significant unit within *C. rimiculus* because: 1) there are no opportunities for gene flow into this population; and 2) they are currently the only identified population of dwarfed fish within this species, thus representing an important evolutionary legacy for *C. rimiculus*."

The Jenny Creek sucker and redband trout are sensitive indicators of the general health of the watershed. The events and circumstances that occurred in the system over the years, presumably, had a deleterious affect on these fish and continue to present problems today. Bob Bessey (1988) summarized the situation when he wrote "It is highly probable that significantly depleted stream flow, periodic addition of large quantities of sediment and elevated water temperatures are contributing to subtle declines of trout and sucker populations in Jenny Creek and several of its tributaries."

Bessey's contentions are largely based on evidence from other watersheds under similar circumstances because quantified, long-term baseline fisheries data for Jenny Creek is unavailable. It is very probable that the transfer of a large portion of the stream flow outside the basin has created substantial changes in the quality of habitat over the past 60 plus years. Water diversions from Hyatt and Howard Prairie Reservoirs, from Soda and Beaver Creeks by Talent Irrigation District (TID), and from Shoat Springs Creek by Pacificorp export approximately 30,000 acre feet of water annually from the Jenny Creek Basin (Bessey 1988). This quantity represents 28 percent of the estimated total runoff that would otherwise be available to support the basin's fish populations. One effect of reduced stream flow is the stream's lessened ability to transport accumulated sediments out of the system. Reduced flows also cause reduced space for rearing and food production. Fish are concentrated in less space where they compete for a reduced food supply and hiding cover. They are much more vulnerable to bird and mammal predators. Effects of the lower peak flows are probably most severe in Keene Creek and in Jenny Creek upstream of its confluence with Johnson Creek. The TID and Pacificorp diversions have altered habitat conditions in 24 miles of Jenny, Soda, Keene, Beaver and Shoat Springs Creeks, representing 84 percent of the habitat currently used by the Jenny Creek sucker. Water diversions for agricultural purposes along Jenny, Keene, Beaver and Corral Creeks have also cumulatively reduced stream flows from natural, undisturbed levels (Bessey, 1988). BLM, in cooperation with Oregon Water Trust, has made application with the Oregon Water Resources Department to transfer the irrigation water rights for the Ranch to in-stream use for the benefit aquatic resources.

The effects of the human-caused reduction in stream flows was further aggravated by the ten plus years of drought that was recently experienced in the Pacific Northwest. The drought was especially pronounced in 1994, and several streams became dry by July including Johnson, Corral, Mill and Lincoln Creeks. Other streams were reduced to a mere trickle. The stream flow at the north end of the Box-O Ranch (R.M. 9.5) on August 24 was 2.8 cubic feet per second (cfs) while on August 10, 1993 (a more average water year) the flow at that location was 8.8 cfs. Fortunately, Shoat Springs Creek adds flow and cooler temperatures downstream of this location.

High summer water temperature is another factor affecting sensitive fish species in Jenny Creek. The reduced volume of water in the stream results in reduced insulation against the sun's rays. This, coupled with the removal of stream-side shade trees during accelerated logging in the 1960's and 1970's, has caused water temperatures in excess of 80 degrees Fahrenheit in July and August in lower reaches of the watershed. Ideal summer water temperatures for trout are in the 60 degree range, and once they exceed 70 degrees the fish begin to experience stress and increased metabolism which leads to increased competition for food. Higher temperatures also incubate diseases which readily attack the already stressed fish.

The accumulation of sediment is a major problem confronting fish in the Jenny Creek system. It accumulates in pool and riffle habitats that are important for rearing, food production and spawning. Interstitial spaces in the substrate become clogged with this material and are no longer available for cover and food production, and eggs deposited there are subject to suffocation. Rocks become covered with sediment and are not available as areas for insects and other food organisms to reproduce. Much of this sediment resulted from intensive logging that began in the 1950's. Some of it is still being washed off the myriad of un-surfaced roads throughout the watershed. Livestock grazing, dating back to 1880 in the watershed, damaged stream banks and associated vegetation and continues to do so on some stream reaches. Another major source of sediment in Jenny Creek is the TID delivery canal which has caused two major slides in Township 39 South, Range 4 East, Sections 21 and 22. One slide, in 1982, delivered several hundred tons of rock, soil and debris directly into the stream. Future canal failures continue to be hazard.

Speckled Dace

Speckled dace are the most common native fish in Jenny Creek. They can be found throughout mainstem Jenny Creek and in its larger, slower tributaries. They are most numerous in low-gradient meadow reaches. Although speckled dace currently do not have any special status, preliminary results from a genetic study (Pfrender and Lynch 1998) indicate the Jenny Creek dace could be genetically distinct. Speckled dace are wide spread throughout the west, but have not been reported in other CSEEA watersheds.

Introduced and Exotic Fish

Rainbow trout are native in other drainages in the CSEEA, but not Jenny Creek. Rainbow trout are, however, regularly stocked in Hyatt and Howard Prairie Lakes by the Oregon Department of Fish and Wildlife (ODFW). Howard Prairie Reservoir is not in the planning area, but fish occasionally escape from the lake downstream into the planning area, especially in good water years when water flows over the spillway at the dam. Rainbow trout were also introduced into Jenny Creek by ODFW and private sources in the 1960s and 1980s. Rainbow trout's role in the dilution of the resident redband trout was discussed under that species.

Golden shiner, an exotic fish, was introduced into Howard Prairie and Little Hyatt reservoirs and occasionally escapes downstream with overflow water. Its distribution, survival, and impact on the Jenny Creek ecosystem is not known.

Brown bullhead is also found in the headwater reservoirs of Jenny Creek and has been responsible for the destruction of the trout fishery in Hyatt Lake twice, requiring rotenone treatment of the lake. These fish occasionally escape downstream into the Jenny Creek watershed. Bullhead distribution, survival, and impact on the Jenny Creek ecosystem is not known.

Black Crappie and largemouth bass have become established in Hyatt Lake in recent years, and will most likely escape downstream into Little Hyatt Reservoir and Keene

Creek Reservoir. The Bureau of Reclamation has seldom allowed water to bypass Keene Creek Reservoir, so these fish are not likely to reach lower Keene Creek and Jenny Creek.

Amphibians and Reptiles

Jenny Creek is host to several amphibians that are dependent on the aquatic environment for their survival. The more common ones are Pacific tree frog (*Psuedacris regilla*), foothill yellow-legged frog (*Rana boylii*), bullfrog (*Rana catesbeiana*), Pacific giant salamander (*Dicamptodon tenebrosus*), and rough-skinned newt (*Taricha granulosa*). All are native with the exception of the bullfrog. Still water areas and ponds in the mid and lower elevations in the Jenny Creek Watershed are home to a fairly viable population of northwestern pond turtles (*Clemmys marmorata*). This animal is in trouble throughout most of its range in Oregon, Washington and California due to habitat destruction and predation by introduced species, primarily bullfrogs and largemouth bass.

Mollusks

Mollusks are of particular interest because of the role they play in the food chain and the presence of endemic species. Several snail and a fresh water mussel genera inhabit the Jenny Creek Watershed. The most common snail is a Calibasis snail (*Juga silicula*). *Physella* is also present. These snails add to the rich level of biodiversity and play an important role in the Jenny Creek food chain as competing algal grazers and as food for other animals like spotted sandpipers (M Parker, Biology, S Or Univ, pers comm 1998).

Jenny Creek and its tributaries are also host to eight species of freshwater snails that are on the Bureau's Special Status Species list (Holthausen et al., 1992). Seven of them are in the family *Hydrobiidae* and genus *Fluminicola*. The eighth of these is another Calibasis snail named *Juga acutifilosa*, or scalloped juga. This species is known from only one location in Oregon, that being Shoat Springs. It has also been located in seven other locations in northern California, but at least two of those habitats no longer exist.

Most *Fluminicola* snails are also associated with large, cold springs. Shoat Springs and Spring Creek are particularly important habitats. These snails are endemics that have speciated in Jenny Creek, with some located in very exacting habitats within the watershed. The seven snails in this group have not been taxonomically described, and more investigation should be done (Frest, 1999). Frest recommends that all of these snails be considered for listing under the federal Endangered Species Act.

The fresh water mussel *Margaritifera falcata* and the fingernail clam (*Pisidium casertanum*) (M Parker, Biology, S Or Univ, pers comm 1998) are common throughout the watershed. *M. falcata* appears to be most common in the middle and lower portions of the main stem. This common mollusk in the Klamath and Rogue River systems is found from southern Alaska to central California and east to the Rocky Mountains. There is some indication that the Jenny Creek population is a dwarf version. Maximum shell length of this animal is between 2.5 and 2.7 inches, whereas in the Rogue River shells reach 4+ inches in length. Fresh water mussels move about by parasitizing fishes with an early developmental stage. The fish the mussel uses for upstream migration is not known. The fingernail clam (*Pisidium casertanum*) is found throughout the system, particularly in substrates heavy with sediment.

Crustaceans

What might be the Klamath Crawfish, *Pacifastacus liniusculus klamathensis*, is common throughout much of Jenny Creek. This species is also native to the Rogue and Klamath Rivers.

Aquatic Insects

Aquatic invertebrate surveys have been conducted at four locations in Jenny Creek, and one each in Jenny Springs, Soda, and Keene creeks over an eight year period (Wisseman 1991, 1992, 1993, 1994 and 1995) as a part of the BLM's overall aquatic monitoring program. Aquatic insects are excellent indicators of stream health, because specific insects are tolerant or intolerant of particular stream conditions, such as fine sediments, warm water, and woody debris.

Jenny Creek has an array of aquatic insects. Sampling done in 1991 found 36 taxa in the watershed. Tricoptera (Order) represented 53 percent of the collection. Plecoptera (Order), a group that often serves as indicators of stream health, comprised only five percent of the samples.

Analysis of all the surveys shows a definite pattern that indicates a connection between stream conditions and the aquatic insect community. In lower Jenny Creek, five insect species made up 70 percent of the population (Wisseman, 1995). These five species are all tolerant of fine sediments and warm water which indicate a high fine sediment level on rocks and in the water column.

Macroinvertebrate sampling at the north and south ends of the Box-O Ranch in 1995 found most of the fauna were wide-spread, common North American species associated with mid-order streams. The Jenny Creek samples had a mixture of montane and basin species. Sensitive, threatened and endangered, rare, or small-stream associated species were not collected. Long-lived taxa, such as dragonfly larvae, tolerate warm water. High summer water temperatures in Jenny Creek are lethal to cold water invertebrates and most salmonids.

All of the limiting factors discussed for fish also pertain to macroinvertebrates. Low flows, warm water temperatures and sedimentation presumably limit these resources somewhere below their potential for Jenny Creek. Frest (pers comm 1999) was particularly concerned about impacts from grazing on streams that host endemic snails.

Lake Fisheries

Howard Prairie Reservoir and Hyatt Lake were constructed by the Bureau of Reclamation and are operated by the Talent Irrigation District for irrigation supply and power generation. Only Hyatt Lake falls within the proposed CSEEA planning area.

The two reservoirs have had a history of providing outstanding rainbow trout fisheries. Howard Prairie has been a good trout producer over the years, but Hyatt Lake has had a series of set backs from over population of bullhead catfish. The lake was last chemically treated to remove bullheads in the fall of 1989, and by 1993 the trout were growing at an exceptional rate. The Oregon Department of Fish and Wildlife annually stocks between 150,000 and 250,000 rainbow fingerlings in Hyatt Lake. In addition to the rainbow trout there are largemouth bass and black crappie. Bullhead catfish were not evident in the lake after the chemical treatment project until the spring of 1994 when one was collected during electrofisher sampling. The presence of nesting bald eagles and a desire to manage the lake for trout and largemouth bass may preclude chemical treatment projects in the future.

Two additional lakes, Little Hyatt Lake and Keene Creek Reservoir, are located on Keene Creek below Hyatt Lake. Over the years this lake has been a popular rainbow trout fishery. In addition to rainbow trout, it contains golden shiners and bullhead catfish. Keene Creek Reservoir is a regulating reservoir for the Greensprings power generating plant. It contains a few stunted warm water fish, but is not managed for a fishery due to its fluctuating nature and potential risks to the public.

The only other standing water bodies within the proposed CSEEA are Parsnip Lakes on the north side of Keene Ridge. Several of them dry up periodically, and it is doubtful that the remaining ones are capable of supporting fish populations. These lakes represent a special wetland environment and have educational value.

Stream Fisheries

Jenny Creek provides a trout fishery of exceptional quality. Anglers fish for redband trout on public and timber company lands in the main stem and in the larger tributaries including Keene, Grizzly and Soda Creeks. No estimate of angler numbers or numbers of fish taken in past years are available.

The redband trout is considered by the U. S. Fish and Wildlife Service to be a sensitive species, and as such has been receiving increased attention by ODFW and BLM. Since 1988, the BLM has sponsored volunteer work projects to stabilize sources of erosion and to plant stream side vegetation. Additional riparian restoration is planned for the future.

Stream Channels

Floodplain areas on Jenny Creek were much different prior to 1850 than at present. Large areas of the Jenny Creek Watershed were probably subject to stand-replacement fires every 100-200 years (see Fire Section), providing large quantities of sediment, nutrients, and large woody debris to the system. Periods between fires were characterized by relatively low rates of sedimentation, primarily from other natural processes including low-intensity fire, major storm events, and slope failures. At low flows, the stream most likely meandered through a wetland floodplain in a series of narrow channels only capable of carrying low flows, similar to present-day conditions on Grizzly Creek below its confluence with Soda Creek, and portions of Jenny Creek between Johnson Creek and Beaver Creek. Beaver were abundant, adding further energy-dissipating and sediment-capturing structure by their dams and impoundments to the floodplain areas, and raising water tables leading to widening riparian zones. During the winter and spring months, high flows would cause the stream to rise out of the low-water channel, probably inundating the floodplain areas for weeks or months on end, similar to the present situation on portions of Johnson Creek. Because of the low stream gradient and the dissipation of stream energy across the floodplain, the active channel did very little downcutting as it migrated, with only slight differences in elevation between the active channel bottom and the floodplain.

During the mid-1800s, trapping pressure may have removed much of the beaver influence from Jenny Creek. A major stand-replacement fire may have burned a significant portion of the watershed during this same time period (see Fire Section), and livestock grazing began to impact vegetation conditions in the area. The largest floods in the last 150 years may have occurred on Jenny Creek in the 1860s, at the same time the largest floods on record affected the nearby Rogue Basin. Regeneration of large riparian vegetation, which typically occurred following removal by flood flows or beaver activity, was retarded or prevented by grazing pressure. A lack of new beaver dams probably broke the sediment capture/high water table/energy dissipation function they provided. As the influence of these elements declined in these floodplain/wetland areas, stream energy was sufficient to begin channelizing the stream, leading to less-frequent floodplain inundation and a decline in floodplain water tables.

Floodplains were cleared to provide more pastureland with the establishment of ranches in the area. Intensive grazing led to soil compaction, which subsequently causes decreases in infiltration and increases in runoff on the floodplain. Because of declining water tables, irrigation of the floodplains became necessary for longer periods each year. Irrigation was applied on surrounding valley slopes as well. During annual high flow events, the stream would still inundate the floodplain, depositing debris on the pastures and providing a dangerous situation for livestock. The inundation also rendered large areas of pasture unusable at certain times of the year. This situation led to deliberate efforts to channelize the stream. Eventually, much of the stream through ranch lands was straightened out, substrate material was scooped out of the channel to form berms to prevent the stream from exceeding its banks, and stream-side shrubs and trees were removed to prevent debris jams from forming or channels from migrating. This was the case with the Box-O Ranch (see Existing Environment for Box-O Ranch).

Riparian Habitat

Riparian areas in the upper half of the watershed are wider and moister than those in the lower half of the watershed and are dominated by Douglas-fir (*Psuedotsuga mensezii*), alder (*Alnus*), and willow (*Salix spp.*). Riparian areas in the lower half are narrow and dominated by willow, ponderosa pine (*Pinus ponderosa*), and Oregon ash (*Fraxinus latifolia*). Extensive riparian logging in the 1960s, especially in the upper watershed, has limited the amount of large diameter large woody material, or coarse woody debris (CWD), available to many of the tributaries and, therefore, mainstem Jenny Creek. The distribution of CWD is very clumped (Rossa 1999). In-channel and riparian areas, wood is concentrated primarily in the upstream canyon reaches that still retain large-diameter trees. In-channel debris jams are present, but not as extensive as one would expect in the lower canyon reaches. Riparian wood is rare in the lower meadow reaches because it was removed to facilitate plowing of pasture land. High water in the winter of 1997 and 1998 moved some wood into these lower canyon and meadow reaches, but overall, it will take some time for wood to become well-distributed throughout the system again.

In general, riparian condition appears to be slowly improving in the watershed. Changes in grazing strategy, recovery of previously logged riparian areas, riparian fencing, and streamside plantings are all contributing factors. However, some areas continue to be heavily impacted by land use activities.

Standard widths for Riparian Reserves are provided in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD). These widths have been adopted for streams in the Jenny Creek Watershed. Basically, fish bearing streams have a width equal to the height of two site potential trees, or 300 feet upslope on either side of the stream (600 feet total, including both sides of the stream channel), whichever is greater. The width for a Riparian Reserve for permanently flowing, nonfish-bearing streams is equal to the height of one sight potential tree, or 150 feet upslope on either side of the stream (300 feet total, including both sides of the stream channel), whichever is greater. The width for seasonally flowing or intermittent streams is equal to the height of one site potential tree, or 100 feet upslope on either side of the stream, whichever is greater. More detailed information on Riparian Reserves is provided in the ROD (page C-30). Riparian Reserves for streams in the Jenny Creek Watershed are shown on map 13.

Bear Creek Watershed

The west side of the CSEEA planning area encompasses a portion of the Emigrant Creek drainage (Bear Creek watershed) from just north of the confluence with Baldy Creek south to the headwaters. Refer to the Hydrology section for miles of stream included. Aquatic resources, channel characteristics and riparian habitat are discussed in the following text.

Aquatic Resources

The upper reaches of Emigrant Creek host three fish and at least two amphibians. This watershed also supports an assortment of macroinvertebrates, but they have not been sampled and little is known of their makeup.

Fish

Both resident rainbow trout (*Onchorhynchus mykiss*) and cutthroat trout (*Onchorhynchus clarki*) reside in the analysis area, but prior to 1999 species distribution were not well known. The ODFW stream survey of Emigrant Creek (ODFW-BLM 1997) noted trout upstream to the mouth of Porcupine Creek, but apparently no effort was made to identify them as to species. Bob Bessey, BLM fishery biologist, had confirmed the presence of cutthroat trout in Porcupine Creek (pers. comm. 1999). The Medford Grazing Management Plan EIS (1983) lists cutthroat trout in 0.75 miles of Emigrant Creek, 0.50 miles of Baldy Creek, 0.30 miles of Green Mountain Creek, and 1.00 mile of Porcupine Creek. This information was based on some early surveys that determined fish presence in streams without attempting to find upstream limits.

Much new information reaffirmed, or added to, our understanding of fish resources in the Bear Creek Watershed in 1999. Electofishing sampling was done by ODFW in the spring of 1999. They made every effort to determine upstream limits of fish and included many streams not previously sampled or surveyed. Resident trout, including both cutthroat and rainbow were confirmed in nearly eight miles of stream in the CSEEA planning area.

The Oregon Department of Fish and Wildlife annually releases hatchery-reared rainbow trout into Emigrant Reservoir, and has released steelhead and coho in the past. In the spring, these trout accumulate at the inflow of Emigrant Creek, and some fish move into the stream above the lake. A fishery has developed around this activity. It is unknown how far upstream these non-native fish go but it is assumed that they have altered the genetic integrity of native fish in a portion of this stream.

The reticulate sculpin *(Cottus perplexus)* is the only native non-game fish known to reside in the planning area. ODFW sampling efforts found this species in Porcupine Creek, but it is suspected to be as widespread as trout species.

Amphibians and Reptiles

There is little information available about amphibians in the Emigrant Creek Watershed. Pacific tree frog (*Pseudacris regilla)* and Pacific giant salamander (*Dicamptodon tenebrosus),* are present, and rough-skinned newt *(Taricha granulosa)* and foothill yellow-legged frog (*Rana boylii)* are suspected residents because of the close proximity to populations known to exist in the Jenny Creek and the Klamath-Iron Gate watersheds. Northwestern pond turtles *(Clemmys marmorata)* are common residents in Emigrant Reservoir, but upper portions of Emigrant Creek and its tributaries are too steep and lacking of pool habitat to attract and support this animal.

Macroinvertebrates

No in-depth surveys have been conducted on macroinvertebrates, so the composition of this resource is unknown. Fingernail clams (*Pisidium casertanum*) were sampled from a seep in upper Porcupine Creek in January 1999.

Stream Channels

Level 1 Rosgen stream channel typing (Rosgen 1996) has been done for all streams in the Upper Bear Creek Watershed Analysis Area. A variety of channel morphological stream types exist, ranging from Rosgen type Aa+ to type G.

A physical stream survey was completed in 1997 by the Oregon Department of Fish and Wildlife (ODFW) on 8,000 meters (approximately 4.9 miles) of Emigrant Creek above the confluence of Tyler Creek. (ODFW-BLM 1997). Data from the survey indicates that the gradient of the stream increases from about 3 percent at the mouth of Tyler Creek to nearly 6 percent at the mouth of Porcupine Creek. Stream substrate is a mix of bedrock, cobble and fines, and stream habitat is dominated by rapids and scour pools. There are few pools in Emigrant Creek, far less than the >35 percent desired ODFW benchmark, and most of the pools are less than one meter in depth with some notable exceptions. The survey stated that there is very little coarse woody debris in the stream. Even in the best reaches it does not exceed eight pieces per 100 meters, and most of it is small diameter material. Substrate material is 20 to 30 percent silt. Many reaches have a high percentage of bedrock (up to 40 percent), with the remainder primarily composed of gravel and cobble. The entire survey section is well shaded (75-80 percent). Most of this section of Emigrant Creek is confined in a narrow V-shaped valley with moderate to steep hillslopes. More detailed data from the ODFW stream survey is provided in the Upper Bear Creek Area Watershed Analysis (USDI, 2000b).

The other major tributaries in the Upper Emigrant Creek sub-basin have gradients that are steep, usually greater than 10 percent, and channels are entrenched with steep hillslopes. Most of these stream channels are Rosgen type Aa+. Transported material is quickly moved through these reaches and what is not deposited in upper Emigrant Creek or along its limited flood plain ends up in Emigrant Reservoir. Substrate in these upper tributaries is mostly bedrock and cobble. There is little woody material in most of these streams, but shading is fairly good.

Riparian Habitat

Stream side vegetation varies considerably in the Emigrant Creek Watershed depending on aspect and elevation. California black oak, Garry oak, and Oregon Ash are common components of overstory riparian vegetation. Other deciduous trees, most commonly white alder, provide a discontinuous diversity. Big-leaf maple, black cottonwood, Ponderosa pine, Douglas fir and incense cedar, while not common, are also present. Riparian growth in drainages flowing from the east exhibits a pronounced influence from aspect. South facing slopes have dryland plant components while north facing slopes a covered with a mixture of coniferous and deciduous vegetation. Douglas fir and white alder provide good stream shading along Emigrant Creek above the mouth of Tyler Creek. This combination gives way to a white fir dominated plant community near the highest elevations in the watershed.

Riparian Reserves have been established along streams in the Upper Bear Creek Watershed Analysis Area and are shown for BLM lands on map 13. Standard Riparian Reserve widths, as provided in the ROD (C-30), have been adopted (See discussion for Jenny Creek Watershed).

Klamath-Iron Gate Watershed

The Klamath-Iron Gate Watershed includes two sixth field watersheds that fall within the CSEEA planning area; Camp Creek and Scotch Creek. The planning area includes only that portion of Camp Creek north of the Oregon/California border, however, all of Scotch Creek above Iron Gate Reservoir on the Klamath River is included. Scotch Creek flows through the Horseshoe Ranch Wildlife Area in California.

Aquatic Resources

Fish

Stream survey reports written by ODFW (ODFW-BLM 1997) and BLM (King and others 1977) for Camp and East Fork Camp Creeks include numerous sightings of trout throughout the surveyed portions. The BLM account identified the fish as rainbow (*Onchorhynchus mykiss*) and established the upper limit of fish use at a waterfall just above mile 5.00. The ODFW survey report (1997) stated that fish observations were common and seen throughout the surveyed reaches. One trout was positively identified as a cutthroat trout (*Onchorhynchus clarki*). Whether both species co-exist in the Camp Creek system is questionable. George Wright (1954), who wrote numerous antidotal stories about when he was a young boy and young man in the Klamath country, mentions good populations of "mountain trout" in the Camp Creek system.

Very little was known of resident fish populations in Scotch and Slide Creeks prior to 1999, when BLM fisheries biologists undertook presence and absence surveys in an effort to fill this data gap. Resident rainbow trout were observed in Scotch Creek from the mouth upstream to a rock barrier a short distance above the Oregon/California border in T.41S., R.3E., Section 8, SW 1/4. Rainbow trout were also found to be plentiful in Slide Creek from its confluence with Scotch Creek upstream to the Oregon/California border.

The BLM survey of Camp Creek (King and others 1977) noted that stream flow "is low in late summer (approximately 1 cfs at the mouth on 8/5/75); however water temperature is not prohibitive for salmonid habitat (61 degrees F at the mouth at 10:00 a.m. on 8/4/75)." Good shade cover helps to maintain this cool water, however, ODFW (ODFW-BLM 1997) indicated portions of lower Camp Creek were dry during their August/September survey. Deep pools, suitable for juvenile rearing habitat, are lacking, but gravel of suitable size for spawning is available. Three possible fish barriers were noted by both surveys. One is near mile 1.25, one near mile 2.00, and the third one at mile 2.75. Trout were observed between the barriers and above the last one to mile 5.5. Stream conditions are apparently very good for aquatic insects.

Hatchery produced rainbow have been released into Iron Gate Reservoir. Their different genetic makeup may have affected the genetic integrity of native trout below barriers in lower Scotch and Camp Creeks.

The Klamath smallscale sucker (*Catostomus rimiculus*) migrates into tributaries of the Klamath River to spawn. Suckers that reside in Iron Gate Reservoir move into Scotch and Camp Creeks in spring months for this purpose. King and others (1977) noted that juvenile suckers exceeded 50 per 100 feet in slower waters within a few yards of the mouth but there is no record of these fish above the Oregon/California border.

Marbled sculpin (*Cottus klamathensis*) is a another common stream dwelling fish in the Klamath River Basin. Hohler (1981) collected this fish in lower Jenny Creek while doing research on the Jenny Creek sucker. It is reasonable to assume this fish resides in streams in the planning area as well.

Hohler (1981) also found fathead minnow (*Pimephales promelas)* below a waterfall on the lower reach of Jenny Creek while doing his research. It is possible that this introduced fish also resides in the lower reaches of Scotch and Camp Creeks.

Following the completion of Iron Gate Dam in 1962, access by anadromous fish to these streams was curtailed. Chinook and steelhead historically migrated well upstream of Iron Gate and Copco Dams, but it is uncertain how far upstream coho moved. Brood fish were initially captured at a trap located at Klamathon downstream of Iron Gate Dam. Steelhead moved into a number of small tributaries in winter months to spawn. Wright (1954) indicated that these fish used Camp Creek upstream to the first falls, and stated that Rocky Gulch, a lower tributary on Camp Creek is (was) "a good little stream for steelhead fish in the winter when there is enough water." King and others (1977) suspected that chinook spawned in lower Camp Creek also.

Amphibians

Parker (1999) surveyed creeks in the Klamath-Iron Gate watershed for vertebrates. No stream dwelling amphibians were found although all habitat requirements were present for Pacific giant salamanders (*Dicamptodon tenebrosus*) and tailed frogs (*Ascaphus truei*). He found rough-skinned newts (*Taricha granulosa)* in upper Scotch Creek, which are also known from small excavated ponds near Bean Cabin in the headwaters of Camp Creek (BLM). It is assumed that Pacific giant salamander(*Dicamptodon tenebrosus*) is in the perennial portions of streams, although the species was not found by Parker (1999).

Macroinvertebrates

In 1993, Robert Wisseman conducted macroinvertebrate sampling in Dutch Oven Creek in the Camp Creek Subwatershed as part of BLM's overall aquatic monitoring program. Wisseman found that Dutch Oven Creek has a high aquatic insect diversity. Many of the species are indicative of cold water and cobble habitat that is not embedded by fine sediments (Wisseman 1993). King (1977) wrote that "aquatic insect life, including representatives of the Orders: Plecoptera, Tricoptera and Ephemeroptera, were noted in abundance" in Camp Creek.

Interestingly, the species that Wisseman found in Dutch Oven Creek are not typical for medium-elevation streams in a xeric (dry) area. Dutch Oven Creek in particular supports an invertebrate fauna more typical of moist, maritime and mid-higher elevation western Cascade streams (Wisseman 1993). Wisseman believes that these insects are a relict community left over from the last glaciation. "If so", Wisseman states, "there is a high probability that some of these insects may be candidates for special status."

Parker (1999) discovered that streams with similar physical characteristics (upper Scotch, Dutch Oven and Camp Creeks) had similar aquatic insects with aerial life stages.

Although mollusk surveys have not been completed for the entire analysis area, Wisseman's 1993 macroinvertebrate survey in Dutch Oven Creek found snails of the Hydrobiidae family that may be endemic to these streams (Wisseman 1993). Hydroboid snails (*Fluminicola*) were recently discovered at sites of cold water inputs along both Camp and Dutch Oven Creeks (Parker 1999).

Klamath crayfish (Pacifastacus liniusculus klamathensis) is a common inhabitant of Jenny Creek and the Klamath River system. It is most likely well established in Iron Gate Reservoir, but there is no evidence from stream surveys or other recorded observations that it resides in Scotch or Camp Creeks.

Stream Channel

Stream surveys were completed on the lower 5.5 miles of Camp Creek by the BLM in August 1975 (King and others 1977). Additional surveys were completed by the Oregon Department of Fish and Wildlife (ODFW) on Camp Creek, above the mouth of Salt Creek, and East Fork (also known as Right Fork) Camp Creek in 1997 (ODFW-BLM 1997). The mouth of Salt Creek is approximately 1.5 mile south of the Oregon state line. No survey data is available for Scotch Creek, therefore, descriptions of its stream characteristics are based on aerial photos and field observations by BLM personnel.

The Level I Rosgen stream channel morphology classification system (Rosgen 1996) was used to classify streams in the watershed. A variety of channel morphologies exist, ranging from Rosgen type Aa+ to type G. This information is provided in detail in the Klamath-Iron Gate Watershed Analysis (USDI, 2000a).

The Scotch Creek drainage, including its primary tributary Slide Creek, covers approximately 11,503 acres. Stream gradient is low to moderate from Iron Gate Reservoir to the Oregon border, but steepens beyond that point. The channel flows through a narrow valley near the confluence with Slide Creek, then it is confined in a narrow V-shaped valley with steep hillslopes to its headwaters.

Camp Creek and its major tributaries, Dutch Oven and Salt Creeks, comprise the largest subwatershed with a total of 12,579 acres. Physical stream survey data collected by ODFW (ODFW-BLM 1997) and by BLM (King and others 1977) provide a description of Camp Creek and East Fork Camp Creek. The ODFW survey found a low to moderate gradient that averages 0 to 2.5 percent Camp Creek from the mouth of Salt Creek to the confluence with East Fork Camp Creek at mile 4.5. The gradient varies from 0.5 to 1 percent over most of the survey area. The gradient increases to 4 percent near the end of the survey. The BLM survey noted that upper stream reaches have gradients in excess of 7 percent. Much of the Camp Creek channel is entrenched with low terraces within a V-shaped valley with steep hillslopes. Rapids predominate the stream surface area. Pools are shallow, averaging about 0.5 meters. There are no pools with the desired 1+ meter depth.

The substrate has very little silt and organics. Sand and cobble predominate, with more bedrock showing above the Oregon border. Three bedrock falls occur within the first three miles, and create impasses to upstream migration of fish (King and others 1977). Substrate material above East Fork Camp Creek is a mixture of fines and cobble over bedrock. The volume of woody debris in Camp Creek is low with an average of only five pieces per 100 meters of stream channel. The ODFW survey of East Fork Camp Creek noted that over 50 percent of the bank area showed active erosion, some of it because of cattle activity. In 1977, a high degree of bank erosion was also noted by King along Camp Creek above mile 3.5. This report attributed the disturbances to cattle. Off-highway vehicle (OHV) use in the watershed is responsible for some upslope erosion and subsequent siltation in the subwatershed. Other influences on the stream from rural development along lower Camp Creek include water withdrawal, sediment from road runoff, removal of riparian vegetation, and streambank trampling by cattle.

Parker (1999) attributed the presence of heavy sediment deposition in the east fork of Camp Creek to human-caused impacts (road building, timber harvest, grazing).

Riparian Habitat

Riparian vegetation at lower elevations in Camp and Scotch Creeks is confined to narrow corridors on either side of the perennial streams, especially in areas characterized by narrow V-shaped valleys and steep hillslopes. Tree and shrub growth in these corridors is fairly thick and provides good shade. The 1997 ODFW stream survey noted that Lower Camp Creek is well shaded with an average of about 60 percent coverage. Dominant species are alder, Garry oak, black oak, big-leaf maple, Oregon ash, willow and some black cottonwood. Ponderosa pine, Douglas-fir and western juniper are present, but scattered. Understory vegetation is most commonly Oregon grape, snowberry, and ceanothus. Skunkbrush (*Rhus trilobata)* and mock orange (*Philadelphus lewisii*) is also present.

Riparian vegetation in the Camp Creek and Scotch Creek Subwatersheds transforms to other species as elevation increases. Douglas-fir, intermixed with ponderosa and sugar pine, becomes common near the Oregon border. Mock orange is a more common understory species. Further up the slope these plant communities give way to expanses of roseaceous chaparral. At the highest elevation, headwater drainages are encompassed in fairly continuous coniferous forest dominated by white fir.

Riparian Reserves have been established along streams in the Klamath-Iron Gate Watershed and are shown for BLM lands on map 13. Standard Riparian Reserve widths, as provided in the ROD (C-30), have been adopted (See discussion for Jenny Creek Watershed).

Cottonwood Creek Watershed

The CSEEA planning area covers a small portion of the Cottonwood Creek Watershed, including short segments of the East Fork Cottonwood Creek, Hutton Creek, Chocolate Falls Creek, and Bear Gulch. BLM has not completed a watershed analysis for this watershed, nor is it aware that any agency has conducted a physical stream survey of the Oregon portion. Specific knowledge of distribution and composition of aquatic resources north of the state line is lacking.

Aquatic Resources

Dennis Maria, Fisheries Biologist for California Department of Fish and Game (per comm 1999), provided some information. According to local ranchers steelhead spawn in the lower two miles of Hutton Creek and once spawned up to five miles above the mouth, but still south of the Oregon/California border. Neither Maria or David Haight, fisheries biologist for ODFW (1999), have knowledge of resident trout in Hutton Creek.

In April 1999, ODFW conducted presence/absence surveys for fish in the East Fork Cottonwood Creek north of the Oregon/California border (Volpe 1999). They found adult steelhead and rainbow trout in the main stem from the border upstream approximately three miles to the railroad track crossing in T.40S.,R.2E., Section 31 above Bear Gulch. Upstream fish use in the East Fork appeared to end at this location due to an impassable concrete box culvert under the railroad track crossing. Only adult fish were observed for some distance below the culvert. The East Fork was involved in a chemical spill from a train wreck in 1998 which resulted in a fish kill. This possibly explains why no young fish were seen in the upper portion of the East Fork. Juvenile salmonids, possibly steelhead, were found in two un-named tributaries to the East Fork, also in section 31. Fish use in one of the two tributaries was noted upstream to the railroad track crossing as well. Lacking permission to access the private land, Volpe ended their survey there, but he did record a road culvert a short distance upstream that appeared to be a barrier. Fish use in the second tributary extends upstream above the confluence with the East Fork only 400 feet where a debris jam appears to block upstream fish passage.

Very little is known of other aquatic resources in the Oregon portion of this watershed. Volpe recorded one unidentified frog in one of the two tributaries during the presence/absence survey.

Stream Channels and Riparian Habitat

Volpe (1999) made notations concerning stream channel condition while doing the fish presence/absence survey in the East Fork Cottonwood Creek. He wrote that stream habitat upstream of the un-named tributaries was poor with a deeply entrenched channel. The substrate material was about 90 percent silt, and he expected there to be very limited spawning in this reach. He also recorded that riparian vegetation in this section was sparse with very little woody debris. Cover along the stream was limited with few pools and very little shade. Volpe did indicate, however, that the East Fork just north of the state border provides spawning habitat for both rainbow trout and steelhead.

Habitat in the un-named tributaries, according to Volpe, is moderate. The larger of the two streams flows through a pasture in a deeply entrenched channel with large amounts of silt. He also noted little channel complexity, little woody debris, and few good pools. This stream has some riparian cover that consists mostly of willows. The second tributary has some good habitat initially, but further upstream it flows through a pasture and is deeply entrenched.

It has not been possible to establish Riparian Reserve widths, because of incomplete information on fish distribution in the East Fork Cottonwood Creek and Hutton Creek and the extent of perennial stream flows in the watershed on BLM lands. Therefore, there is no entry for these streams on map 13.

Table 2-7. Major Plant Communities on Public Lands within the CSEEA

Plant Communities	Area (acres)
Grassland	9,788
Shrubland	6,573
Woodland	6,411
Mixed Conifer	26,045
White Fir	3,135
Semi-wet meadows	31
Wet meadows	76

Vegetation

The vegetation patterns and plant communities in the CSEEA are the result of the interaction between the living organisms and their environment over time. Topography, aspect, soils, geology, climate, fire, other organisms (pathogens, herbivores, vectors), geographical position at the nexus of the Cascade, Klamath, and Eastern Cascade Slope Ecoregions interact to develop the complex and rich pattern of CSEEA vegetation.

Plant communities in the CSEEA area can be broadly classified into grasslands, shrublands, woodlands, mixed conifer, white fir, semi-wetlands and wetlands. Although these communities do not reflect the full biological richness of the CSEEA, descriptions in the following sections on rare and threatened plant and wildlife species, habitat, and communities and land use allocations better describe the area's biological richness. Map 3 serves as a framework for describing the ecology and distribution of plant communities across the CSEEA landscape.

The mixed conifer plant community occupies the greatest area within the CSEEA landscape (26,045 acres). White fir predominates on more fire protected areas at high, above 4,500 feet, elevation (3,135 acres). Grasslands, shrublands and woodlands (22,772 acres) dominate on southerly facing slopes leading downwards from Pilot Rock, Soda Mountain, and Keene Creek Ridge towards the California border and the Klamath River. (see table 2-7).

Table 2-7 shows area occupied by major plant communities on public lands within the boundaries of the analysis area.

Plant Communities

Few classification systems cover all communities/associations falling within the general categories of grasslands, shrublands, woodlands and conifer communities in the CSEEA. Plant communities/associations are arranged to correspond with the coarse plant community groupings of map 3. A brief description of the coarse plant communities found in the CSEEA follow, for a complete description of the plant communities refer to Appendix C. Other sources of information include a plant list compiled from sensitive plant surveys and plant community surveys for the Oregon Gulch RNA and Scotch Creek RNA (Appendix O). Finer detailed maps of plant communities are compiled for the ACECs and RNAs.

Grasslands

Slope, aspect, elevation, edaphic conditions, mineralogy, fire history, and weed invasion all play a role in creating the range of grasslands present within the analysis area. The grasslands are dominated by Bluebunch wheatgrass (*Agropyron* [*Pseudoroegneria*] *spicata*), Idaho fescue (*Festuca idahoense*), Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*), California oatgrass (*Danthonia californica*), pine bluegrass (*Poa secunda* [*P. scabrella*]), and various forbs.

It is likely that many grasslands have converted to annual grasses and starthistle consequent to fire suppression, poor livestock management, and weed invasion. Particularly susceptible are sites with soils dominated by montmorillonitic clays. The moisture induced shrink-swell action of the clays constitutes an endogenous disturbance favoring weed invasion.

Steep Foothill Grassland

Bluebunch wheatgrass dominate the site with variable amounts of Idaho fescue and Lemmon needlegrass. Sites occur on shallow soils on south-facing slopes that exceed 40 percent. Elevations range from 1,800 to 4,000 feet.

Steep Mountain Grassland

Idaho fescue (*Festuca idahoense*) dominates the site with variable amounts of bluebunch wheatgrass (*Agropyron* [*Pseudoroegneria*] *spicata*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*). Sites are located on steep (over 40 %) south-facing slopes with shallow, rocky soils. Elevation varies from 3,000 to 5,500 feet.

High Mountain Grassland

Variable amounts of Idaho fescue (*Festuca idahoense*) and Lemmon needlegrass (*Stipa* [*Achnatherum*] *lemmonii*) dominate the sites, with minor amounts of bluebunch wheatgrass (*Agropyron* [*Pseudoroegneria*] *spicata*). High snow fall areas. High elevation (above 5,000 feet) with shallow rocky soils similar to Steep Mountain and Steep Foothill Grassland sites.

Dry Meadow

Flatter sites on moderately deep soils with a high shrink swell capacity. Ground vegetation consists of California oatgrass (*Danthonia californica*), pine bluegrass (*Poa secunda* [*P. scabrella*]), and various forbs. Meadow sites with scant canopy cover. Elevation varies from 1,600 to 6,000 feet.

Shrublands

Within the Jenny Creek LSR portion of the CSEEA analysis area, brush fields are occasionally interspersed in the oak woodlands. At lower elevations, patches dominated by whiteleaf manzanita (*Arctostaphylos viscida*), wedgeleaf ceanothus (*Ceanothus cuneatus*), and poison oak (*Rhus diversiloba*) are common. At higher elevations, deerbrush (C. *intergerrimus*), mountain whitethorn ceanothus (C. *cordulatus*), skunkbrush sumac (*Rhus trilobata*), and brown dogwood dominate the brush fields. Chokecherry (*Prunus virginiana*), bittercherry (*P. emarginata*), Klamath plum (*P. subcordata*), birchleaf mountain mahogany (*Cercocarpus montanus*), pale serviceberry (*Amelanchier pallida*), and yellow rabbitbrush (*Chrysothamnus viscidiflorus*) also make up a significant portion of the brushfield flora. This complex collection of shrubs is commonly known as Southern Oregon Chaparral.

Shrub communities occupy a greater portion of the landscape within the Agate Flat area. These shrublands frequently have a hardwood component in the form of Garry oak, birchleaf mountain mahogany, and the various plum species. Communities dominated by members of the rose family (plums and chokecherry (*Prunus* spp.), birchleaf mountain mahogany (*Cercocarpus montanus*), and serviceberry (*Amelanchier alnifolia*) are commonly referred to as rosaceous chaparral. The herbaceous component of the shrub communities are frequently dominated by annual grasses, particularly in the case of wedgeleaf ceanothus and whiteleaf manzanita domination. Starthistle infestations occur throughout the shrubland areas, doubtlessly through wind-dispersal of plumed seeds, as well as agents such as off-road vehicles, livestock, deer, elk, and hiking boots.

Woodlands

Oak woodlands in the proposed CSEEA are predominately at lower elevations and on south-facing and west-facing slopes. Oak woodlands frequently represent the major tree dominated associations of the Agate Flat portion of the proposed CSEEA (in the Lower Jenny Creek subwatershed) and on south-facing slopes of Keene Creek Ridge and Rosebud Mountain. Soils and fire have been the most dominating coarse influence. The result is a mosaic of brush fields, scattered trees, grasslands, and pockets of conifers.

The trees are predominantly Garry oak (*Quercus garryana*) with some California black oak (Q. kelloggii), Pacific madrone (*Arbutus menziesii*), and large scattered ponderosa pines (*Pinus ponderosa*), both living and dead snags, that tower above the surrounding vegetation. The understory shrubs include: deerbrush (*Ceanothus intergerrimus*), poison oak (*Rhus diversiloba*), Oregon grape (*Berberis aquifolium*), whiteleaf manzanita (*Arctostaphylos viscida*), and some bitterbrush (*Purshia tridentata*). The ground layer consists of various forbs and grasses that include: spreading dogbane (*Apocynum androsaemifolium*), hairy honeysuckle (*Lonicera hispidula*), Puget balsamroot (*Balsamorhiza deltoidea*), California fescue (*Festuca californica*), whiteleaf lupine (*Lupinus albifrons*), and several paintbrushes (*Castilleja* sp.). Yellow starthistle (*Centaurea solstitialis*) and various annual grasses, Medusa-head rye (*Taeniatherum [Elymus] caput-medusae*), and bulbous bluegrass (*Poa bulbosa*) are well established naturalized weeds.

Oak woodlands vary from open savannas with a grass dominated understory to forest stands with intermingled Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). On higher slopes, Garry oak may form solid stands of short (<6 m) trees with closed canopies intermixed with native plums and mountain mahogany. Garry oaks at higher elevations approach the diminished size and stature of Brewer oak (*Quercus garryana* var. *breweri*). On the flats, oak forest structure may consist of widely separated, large, old savanna-form oaks (>250 years) surrounded by numerous younger (<125 years) crowded, forest-form oaks. Savanna-form oaks are recognized by their stout trunks, broad, spreading branches, and rounded crowns. Forest-form oaks have slender trunks, ascending branches and are much closer together. Presumably, the savanna-form oaks formed under a regime of frequent light fires. The crowded forest-form oaks developed with the cessation of fire in the last 100 years that allowed seedlings to grow to maturity.

Conifer Communities

Mixed Conifer Zone/White Fir Series

At higher elevations, the Siskiyou and Rogue Valley fades into the Mixed Conifer Zone. The demarcation between zones may be distinct or obscure. Douglas-fir, ponderosa pine, and other conifers become evident often with an increase in golden chinquapin (*Chrysolepis chrysophylla*), Oregon grape (*Berberis aquifolium*), baldhip rose (*Rosa gymnocarpa*), and additional ceanothus species. There is no clear transition at higher elevations between the Mixed Conifer Zone and the White Fir Zone. The Mixed Conifer Zone is found in the Upper Tyler Creek, Baldy, Middle Jenny, Keene Creek, Skookum Creek, Dutch Oven Creek, Hutton Creek and Lower Jenny subwatersheds between 2,500 and 4,200 feet elevation. The Mixed Conifer Zone landscape pattern is coarse grained because of interspersed shrublands, meadows, clearcuts, and forestland.

The Mixed Conifer Zone supports a variety of conifers including Douglas-fir (*Pseudotsuga menziesii*), white fir (*Abies concolor*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), incense cedar (*Calocedrus decurrens*), Pacific yew (*Taxus brevifolia*), and western juniper (*Juniperus occidentalis*). Douglas-fir is the most common conifer with sugar pine, ponderosa pine, and incense cedar also present in the overstory of mature stands. In mature stands, white fir (and Douglas-fir with enough canopy gaps) dominates other understory conifers, which indicates that it is the climax species. Before 1910, more frequent fires prevented the more flammable, shade tolerant white fir from becoming a dominant climax species at lower elevations. As a result of fire cessation, a shift toward dense stands of white fir and Douglas-fir at the expense of sugar pine, ponderosa pine, and incense cedar has occurred.

Much of the Mixed Conifer Zone and all of the white fir zone in the proposed CSEEA would be classified with Atzet and others (1996) as the white fir series which is made up of several white fir (ABCO) associations. White fir associations are recognized by a high rate of constancy (the percent of plots with a given species present) among understory trees. In some plant communities, Douglas-fir might have 100 percent constancy in the overstory but would be considered a white fir association because 100 percent constancy of white firs in the understory.

Atzet and others (1996) WHITE FIR-INCENSE CEDAR/WESTERN STARFLOWER (ABCO 44). This association is particularly well represented in the proposed CSEEA. Douglas-fir, white fir, incense-cedar, and sugar pine are the main overstory trees. White fir is the main constituent among the understory trees and has increased to the detriment of the less shade tolerant sugar pine, Douglas-fir, and incense cedar with lack of fire as an important ecosystem factor. Sugar pine and incense cedar quickly fill in canopy gaps caused by blow-down white fir and Douglas-fir that have succumbed to *Phellinus weirii* and other root rot infections. Root rot play a major role in forest succession and structure. Most of the root rot is present in the northern part of the proposed CSEEA in the vicinity of Hyatt and Howard Prairie Lakes. Sugar pine in many associations often appears as the long-term dominant continuing to grow as generations of white fir and Douglas-fir perish from fire or root rot. Sugar pine usually occurs as isolated individuals and never in solid stands. White fir stocking levels have increased compared to other conifers in the area because of fire suppression and lack of Native American fire land management practice. Under even the lightest fire regimes, young white firs are fire sensitive because of low branches that sweep to the ground creating fuel ladders to the crowns and relatively thin resinous bark.

South of Keene Creek Ridge mixed conifer forests tend to occur as more isolated stands as opposed to the more contiguous stands located to the north. Stands south of Keene Creek Ridge are often surrounded by non-forest grassland and shrubland plant communities while stands to the north are fragmented by historic logging practices. These conifer stands are distinctive as biologically diverse islands and represent unique isolated communities that are the last forest stands in the Klamath physiographic region. Linkage with the Sierra Nevadas occurs further to the east through the eastern Cascades.

Several variants of mixed conifer stands found as islands are of note south of Keene Creek Ridge and Pilot Rock. Below Pilot Rock are stands of Douglas-fir with a large white fir and incense cedar component. Further south and lower in elevation are stands with more of a pine component. Near the California border are stands with both a large dominant ponderosa pine component and a healthy pine understory. Throughout this area are open pine (mixed conifer stands) that grade into woodland pine-oak communities. Many of the mixed conifer stands have extended marginally (ecotonal or transition zones) into non-forest communities in the absence of fire. Another mixed conifer variant occurs in Oregon Gulch (see Oregon Gulch RNA). All of the mixed conifer variants described are distinctive as biologically diverse islands and represent unique isolated plant communities that need further study.

Riparian Vegetation

As defined here, riparian vegetation grows where adequate water from nearby streams and small ponds or a high water table can support a characteristic terrestrial broadleaf deciduous plant community along their margins. These species cope with the long, dry summers of the analysis area by growing where there is adequate water to meet their transpirational needs throughout the dry period.

Typical trees include: Oregon white alder (*Alnus rhombifolia*), black cottonwood (*Populus balsaminifera* var. *trichocarpa*), Oregon ash (*Fraxinus latifolia*), and bigleaf maple (*Acer macrophyllum*).

Commonly encountered shrubs are mock-orange (*Philadelphus lewisii*), willow species (*Salix* spp.), Douglas spiraea (*Spiraea douglasii*), ninebark (*Physocarpus capitatus*), Indian-plum (*Oemleria cerasiformis*), and Douglas hawthorn (*Crataegus douglasii*).

The NRCS (USDA 1993) database identifies a loamy flood plain with associated plants that include willow, himalaya blackberry, common snowberry, skunkbush sumac, Pacific serviceberry, Pacific poison oak, Klamath plum, black cottonwood, Oregon ash, Garry oak, Kentucky bluegrass, and wild grape.

Special Plant Communities

Included within special communities are plant groupings considered rare within the larger, regional landscape (Western Juniper-Garry oak, Rosaceous chapparal), groupings rare within the analysis area (Mountain Mahogany stands, old growth Sugar Pine stands), plant communities susceptible to undesired change (biscuit scablands), or, plant communities of great ecological significance within the analysis area (aquatic vegetation, and wet and semi-wet meadows). Refer to map 15 for location of these special plant communities across the CSEEA.

Biscuit Scabland

The wet lands associated with patterned ground and vernal pools support a diverse and biologically important flora. As vernal pools dry seasonally, they undergo a series of transformations with one set of species replacing another. These vernal pools are characterized by species. Howell quillwort (*Isoetes howellii*), least mouse-tail (*Myosurus minimus*), mountain navarretia (*Navarretia intertexta*), downingia (*Downingia elegans*), and various species of popcorn-flowers (*Plagiobothrys* spp.). The most significant species is Bellinger meadowfoam (*Limnanthes flocosa* var. *bellingeriana*), a Federal Species of Concern and ONHP Level 1 species is discussed further under Plant Species with Special Status section.

The characteristic biscuit scabland, or mound and swale topography is relatively rare on the landscape. In the analysis area these topographies are generally associated with grasslands with a predilection for annual grass invasion.

Western Juniper-Garry oak

Kagan and Caicco (1996) describe a western juniper-Garry oak woodland on south slopes and rolling hills found around Siskiyou Pass and Pilot Rock east along the California border often on deep clay, stony soils. A similar type is found in the Oregon Gulch RNA. Western juniper and Garry oak co-dominant with ponderosa pine along the margins or as isolated individuals within the stand. Wedgeleaf ceanothus is the dominant shrub, although Klamath plum (*Prunus subcordata*), Brewer oak (*Quercus garryana* var. *breweri*), and serviceberry (*Amelanchier alnifolia*) are important under the oak canopy. Idaho fescue (*Festuca idahoense*), bluestem wheatgrass (*Agropyron* [*Pseudoroegneria*] *spicata*), California oatgrass (*Danthonia californica*), pine bluegrass (*Poa secunda*), and needlegrasses (*Stipa* [*Achnatherum*] spp.) are dominant native grasses. However, the habitat is usually dominated by introduced alien annual grasses, including Medusahead (*Taeniatherium caput-medusae*), dogtail (*Cynosurus echinatus*), and various *Bromus* species. Forbs include: wooly sunflower (*Eriophyllum lanatum*), Western hawksbeard (*Crepis occidentalis*), narrowleaf desert parsley (*Lomatium triternatum*), Oregon mariposa lily (*Calochortus tolmei*), Blepharipappus (*Blepharipappus scaber*), and woolyhead clover (*Trifolium eriocephalum*). At lower elevations, yellow starthistle (*Centaurea solstitialis*) can be a significant weed.

Rosaceous Chaparral Types

Brock and Callagan (1999a) have discovered that the eastern Siskiyou rosaceous chaparral for which the Scotch Creek RNA was established consists of three relatively distinct plant communities:

- *Garry Oak/Klamath Plum-Wedgeleaf Ceanothus*
- *Garry oak/Mountain Mahogany-Klamath Plum Chaparral Complex (Lone Pine Ridge)*
- *Garry oak/ Mountain Mahogany-Snowberry Chaparral Complex (Slide Ridge)*

Complete descriptions the above listed plant communities are found in the Scotch Creek RNA section, below, or refer to Appendix C.

Mountain Mahogany

The Curlleaf Mountain mahogany series by Sawyer and Keeler-Wolf (1995) is the only vegetation description that approximates the stands of Mountain Mahogany occurring within the analysis area. However, the description includes many species not present within the analysis area.

Rock Outcrops

Rock outcrops are sparsely vegetated with the most frequent species being western juniper (*Juniperus occidentalis*), Klamath Plum (*Prunus subcordata*),Cheat grass (*Bromus tectorum*), *Pseudoroegneria spicata*, pale madwort (*Alyssum alyssioides*), hotrock penstemon (*Penstemon deustus*) and California lomatium (*Lomatium californicum*). At higher elevations, obtuse stonecrop (*Sedum obtusatum*) is common. A large population of Oregon cliff fern (*Woodsia oregana*) also occurs at the higher elevations. A large sprawling member of the Hydrophyllaceae, branched phacelia (*Phacelia ramosissima* var. *eremophila*), interesting eastern Oregon species, was found in protected (shady) areas of rock outcrops. The distinctive Scotch Creek RNA rock outcrop plant community is frequently associated with grassland complexes and outcrops in tree and shrub dominated communities. Plains prickly pear (*Opuntia polycantha*) is associated with the Cathedral Cliffs area.

Franklin and Dyrness (1988) describe two xeric meadow communities that could be associated with rock outcrops: forest openings with exposed bedrock dominated by cryptogams; and rock-bound communities dominated by obtuse stonecrop (*Sedum oregonense*), caespitose Polygonaceae, and xeromorphic ferns.

Semi-Wet Meadows

Sites are located on flats under semi-wet conditions. Moderately deep, clay-loam soils are poorly drained. The site is dominated by California oatgrass (*Danthonia californica*) and meadow sedge (*Carex praticola*). Swamp buttercup (*Ranunculus orthorhynchus*) is usually the dominant forb on various elevations.

Meadows in the White Fir Zone frequently have islands of white fir in them. The white fir in these islands form compact, densely stocked units where crowns extend to the tree base on the outer meadow edge. The interiors of these tree groups are protected from wind exposure and moisture extremes. A moist, shady microclimate is maintained that is beneficial to tree and stand vigor and that is preferred habitat for many wildlife species.

Some openings in the white fir forest are maintained by late melting snow fields. These openings are important as the main habitat for Klamath lambs-tongue (*Erythronium klamathense*), an endemic species known mostly from the Southern Cascade and Klamath River Ridges Ecoregions. Yellow-bells (*Frtilliaria pudica*), also abundant in these openings, is an example of an east of the Cascade species that points to the importance of the analysis area from the standpoint of connectivity. Yellow-bells reaches its western most distribution in the Rogue River Valley.

The NRCS (USDA 1993) data identify poorly drained bottoms (rush, sedge, mannagrass, cattail, willow, timothy), wet loamy terraces (Douglas spirea, common snowberry, Ponderosa pine, Idaho fescue, Western fescue, Pacific serviceberry), semi-wet meadows (California danthonia, sedge, clover, timothy, redtop, Canada bluegrass, Kentucky bluegrass, slender wheatgrass), and wet meadows (tufted hairgrass, meadow barley, sedge) as plant communities associated with wet edaphic conditions.

Aquatic Vegetation

Aquatic vegetation consists of those species that grow in or near still or flowing water and may be free-floating or attached and/or emergent. Free-floating species include various duckweeds and their relatives (*Lemna, Spirodela,* and *Wolffia*). These tiny plants float on the surface of ponds and in still water of flowing streams. Common attached floating vegetation consists of water-star wort (*Callitriche* sp.), waterweed (*Elodea*), various species of pondweed (*Potamogeton*), water smartweed (*Polygonum amphibium*), and Indian pond-lily (*Nuphar polysepalum*). Emergent species include: cattail (*Typha latifolia*), bulrush (*Scirpus* sp.), spike-rush (*Eleocharis* sp.), and bur-reed (*Sparganium* sp.), and water plaintain (*Alisma* sp.). These species occur at different places in the proposed CSEEA (in streams, stockponds, and the Parsnip Lakes) depending on current water depth and substrate.

There are numerous open, wet areas in the analysis area that support a variety of characteristic forbs depending on soils, hydrology, and seasonality and duration of soil moisture in addition to the semi-wet meadows described Thompson and Drewien (1983). Some open areas with a continuous water supply for much of the growing season support extensive open areas dominated by California false-hellebore (*Veratrum californicum*), with nettle-leaf giant hyssop (*Agastache urticifolia*), parsley-leaf licorice-root, alpine timothy (*Phleum alpinum*), Columbia brome (*Bromus vulgaris*), showy onion-grass (*Melica spectablis*), lupines, paintbrushes, and owl-clover.

Plant Communities defined by Moist Edaphic Conditions

Springs, seeps, semi-wetlands, wetlands and high elevation meadows occupy the smallest area of the landscape relative to other plant communities. Their relative rarity on the landscape define a limited habitat for vascular and non-vascular plants, insects, amphibians, birds and mammals. Unfortunately, the specialized nature of these areas also attract unwanted attention from livestock and off road vehicles.

As a source of water, springs, seeps and other moist areas attract livestock during the drier, hotter parts of the summer. Consequent heavy grazing, deposition of urine and fecal matter, and trampling are detrimental to many permanent residents of these sites. While native ungulates can have the same effect on water sources, their lower numbers make annual landscape-wide impact unlikely.

Wet areas frequently identify more open habitats within conifer plant communities, particularly within the higher elevation white fir habitat. These open areas invite road construction and illicit OHV use. OHVs could disseminate weed seeds and alter the hydrology of wet areas, though their impact is generally less severe than that of livestock. Road construction may alter the hydrology of wet areas, while also providing

Table 2-8. Desired Conditions of Wet Areas

Structural, compositional, and physical characteristics of wet areas	Current Condition	Attainment of Desired Future Condition
Woody plant abundance	Livestock concentration break woody stems, reducing an important structural component of wet areas.	Reduce intensity of livestock impact, use controlled grazing techniques, allow rest years
Herbaceous composition	Grazing favors plants with apical meristems close to the soil surface (grass and grass-like species), and plants reproducing vegetatively.	Reduce intensity of livestock impact, use controlled grazing techniques, allow rest years
Disruption of life cycle	Butterfly reproduction (and other insects) may be disrupted by sudden disappearance of host plant through grazing; isolated nature of wet areas may prevent re-colonization	Remove all livestock use, provide off-site water source
Water dwelling invertebrates and vertebrates	Soft-bodied and other water dwelling organisms are particularly sensitive to livestock trampling; isolated nature of wet areas may prevent re-colonization	Remove all livestock use from wet area, provide off-site water source
Introduction of weeds	Plant communities within wet areas are resistant to weed invasion, however, there is a possibility of livestock and OHVs serving as a vector of dispersal introducing aquatic weedy species	Monitor for weed invasion
Altered hydrology	Roads may permanently alter the hydrology of wet areas. OHVs and livestock alter the surface hydrology of wet soils. Disturbance may alter the physical properties of the soil, affecting soil chemistry and habitat for soil dwelling organisms	Remove all livestock use from wet area, ban ORV use within meadows
Surface and soil pore water quality	Fecal matter and urine deposition alter the chemical composition of surface and pore water. Removal of vegetation may reduce the amount of oxygen pumped into the soil profile by vascular plants, thus altering the soil redox potential. Above factors are detrimental to most wet soil dwelling organisms. The combination of nutrient deposition and reduced oxygen pumping may create anoxic conditions devastating to most desired water dwelling organisms.	Remove all livestock use from wet area, ban ORV use within meadows

Table 2-9. Trends toward Desired Condition for Springs, Seeps, Semi-wetlands, Wetlands and High Elevation Meadows

Structural, compositional, and physical characteristics of wet areas	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
woody plant abundance	U	D	I	I+	U
herbaceous composition	U	D	I	I+	U
disruption of life cycle	U	D	I	I+	U
water dwelling invertebrates and vertebrates	U	D	I	I+	U
introduction of weeds	U	D	I	I+	D
altered hydrology	U	D	I	I+	D
surface and soil pore water quality	U	D	I	I+	D

note: it is assumed that fencing of all wet areas is unfeasible-a proportion of wet areas would remain impacted by all alternatives except for alternative D. U= unchanged D= Decrease I= Increase

access for livestock. Removal of existing roads may constitute an undesired disturbance to plant communities that have stabilized since initial road construction.

Ecological Interactions

Fire history and the local effects of fire suppression are not well known. However, the role of fire in plant life-histories is well known. Grasslands, shrublands and woodlands are fire-dependent, and change if fire is excluded. Changes include altered distribution of species over the landscape, increased woody canopy cover with a resultant decrease in understory abundance and species diversity, increased duff accumulation, and reduced seed germination and production. These changes may be desirable or undesirable depending on management or ecological objectives.

Many of the changes caused by fire exclusion often facilitate future weed invasion. Increased canopy cover and deeper duff accumulation create more intense fires which could incinerate seeds and vegetative propagules. Increased physical dominance by an overstory (shrub, hardwood, or conifer) may suppress understory seed production. Any condition which reduces the abundance of native herbaceous plants or seedbanks would facilitate invasion by non-native weeds following a fire event, roadside disturbance, and areas of livestock congregate. .

At lower elevations, particularly within the Agate Flat area, much of the grassland, shrubland and open woodland have an understory dominated by annual weeds. The literature indicates that annual grass dominated plant communities are extremely difficult to convert back to native vegetation. Annual grasses monopolize soil water and nutrients, and alter soil surface conditions, that result in low native grass seedling establishment. Excessive duff accumulation by introduced annual grasses often makes a poor seed bed for native bunch grasses. Open communities at higher elevation retain more of their native herbaceous species, although they may still be susceptible to weed invasion.

The open grasslands, shrublands and woodlands of the Scotch Creek RNA and other CSEEA areas are a testament to the invasive abilities of yellow starthistle (map 14), even in the absence of recent grazing. The source of this invasion by weedy species is from adjacent infestations on uncontrolled grazing areas along the California border. High elevation meadows surrounded by high canopy conifer communities appear particularly severely impacted by past livestock use. Many high elevation meadows retain a native herbaceous component.

The shrink-swell characteristics of the clay soils that are so prevalent in the CSEEA are weed friendly. The eradication of weeds and the establishment of native plants is difficult because of the churning action of the soil, the impenetrable nature of the dry soil, and the lack of soil pore space.

Few shrublands have experienced fire in the past few decades. Most existing shrublands dominated by wedgeleaf ceanothus or manzanita could be described as decadent, since these species are not long-lived reproduce from refractory seedbanks needing heat scarification to induce germination. Other shrub species birchleaf mountain-mahogany, bittercherry, Klamath plum, and chokecherry all resprout from root crowns after fire.

Oak woodlands intergrade with shrublands as well as grasslands. Where hardwoods exist within a matrix of shallow soils, the ecology of the understory approximates that of grasslands. Where mixed shrubs and oaks combinations s of occur, the plant community ecology mirrors that of shrublands. While the oaks and other hardwoods resprout following fire, intense fires following years of litter and fuel accumulation may result in the local extirpation of woody species. Since the native herbaceous component is frequently concentrated below oak canopies, the loss of isolated hardwoods could result in a decline of the native herbaceous component.

Several of the special plant communities described in this document are also considered fire-dependent. The rosaceous chaparral is dominated by members of the rose family. All are known to resprout following fire or surface disturbance. Studies of annual growth rings derived from the Scotch Creek RNA rosaceous chaparral suggest that members of the rose family are able to maintain themselves through resprouting in the absence of fire. However, longer term dominance by Garry oak, a longer lived and physically dominant member of the plant community, is likely after hundreds of years of the absence of fire.

The mix of Garry oak and western juniper is intriguing, since Garry oak is resistant to fire, while juniper is extremely susceptible to fire. Two hypotheses might explain the coexistence of these species. The plant community may have arisen as a result of fire suppression. Juniper could thus be considered to be an invasive component of formerly oak dominated plant communities. Alternatively, the trees coexist on a matrix of fire-safe and fire-prone sites. In this case, juniper would be relegated to rocky or shallow soils unable to support an understory of fuels facilitating the spread of fire. It is likely that both of these scenarios apply. The long history of local use of fire would have extirpated juniper from the landscape if fire-safe areas did not exist. Young juniper can also be observed as an understory component along the edges of black oak and Garry oak gallery forests along Scotch Creek. The latter situation could only occur with fire suppression.

Semi-wet meadows and wet meadows have been severely impacted by past livestock use. While the composition and structure of these communities have been severely impacted, the moist edaphic conditions usually prevent the invasion of non-native weeds, with the exception of introduced non-native forage grasses. Prescribed grazing management practices would allow these plant communities to recuperate and provide the important ecological functions and rare plant/wildlife habitats of the past. Semi-wetlands and wetlands have also been impacted by roads and by off-road vehicles use. In some cases, the restoration of hydrological functioning may be necessary for full plant community restoration.

Riparian areas show similar impacts including excessive historical livestock use, roads, and conversion to pastures in the Box-O Ranch area. Changes in hydrological functioning may prevent the attainment of historical conditions, particularly in areas where water has been diverted, or streams have become channelized or incised. The development of a healthy woody riparian component is of primary importance to improve water quality, particularly along Jenny Creek. Time series photographs indicate considerable improvement in riparian areas over the past 20 years (see livestock grazing section).

Rocky outcrops and rocky meadows usually retain their native flora. The lack of herbaceous component makes these naturally fire-free communities. Lack of herbaceous forage make these communities unattractive to cattle, although they may have been heavily impacted by historical sheep browsing. However, the open nature of these sites invites the use of off-highway vehicles, this is particularly evident in the Pilot Rock area.

Special Status Plant Species

Because of the Cascade Siskiyou Ecological Emphasis Area's location at the confluence of the Klamath, Cascades, Eastern Cascade Slopes and Foothills Ecoregions, unique geology, climate, and topography contributes to the presence of many rare and endemic plants. There are 22 species of Special Status Plant Species (table 2-10) known to exist within the proposed boundaries of the CSEEA. One federally endangered plant is located within the Soda Mountain Wilderness Study Area. This plant, Gentner's fritillary (*Fritillaria gentneri*), has been listed by the U.S. Fish & Wildlife Service as endangered [Federal Register Rules and Regulation. December 10, 1999 (Vol.64, Number 237) Page 69195-69203]. Consultation with the U.S. Fish & Wildlife Service on actions that may affect this species or its critical habitat is required.

BLM Sensitive species are those designated by the State Director to manage to prevent listing. Five Sensitive plant species have been found in the proposed CSEEA and would be managed under BLM policy (BLM Manual section 6840.06C) where the species and their habitats will be protected, managed, and conserved such that BLM actions will not contribute to the need to list the species as threatened or endangered. BLM Assessment species are those that are threatened with extirpation from the State of Oregon.

Tracking Species are plants which need more information before rarity status can be determined but may be threatened or endangered in Oregon or throughout their range. Watch Species are those of conservation concern but are not currently threatened or endangered. This would include plants that are rare but currently stable and plants that are declining in numbers or habitat but are still too common to be proposed as threatened or endangered. While special protection or mitigation is discretionary for Tracking and Watch Species, it is recommended that data be collected and populations monitored for rarity status determination.

Gentner's fritillary (*Fritillaria gentneri*) is a southern Oregon endemic that is primarily known from the area around Jacksonville. Most populations number 10 plants or less. Recent surveys have discovered healthy, large populations in Josephine County to the west. The single CSEEA population of approximately 29 plants is considered disjunct with no other known populations east of the Jacksonville area. This plant normally grows in low elevation oak woodlands, shrublands, and savannahs. As a result of its proximity to valley bottoms and foothills, this plant is susceptible to habitat alteration for agricultural uses and rural residences, and impacts of grazing and collection. These activities are not threatening the CSEEA population because of its relative inaccessibility and its location within a Wilderness Study Area.

Greene's mariposa lily (*Calochortus greenei*) is a large attractive mariposa lily that grows only in southern Jackson County and northern Siskiyou County, California. Its habitat is open thickets associated with Garry oak. Soils are usually deep and high in clay content. The species is at risk from horticultural collection and grazing pressure from deer, rabbits and livestock. Cattle grazing, when properly managed, does not appear to be a threat; however, uncontrolled grazing can severely impact the species (Brock, 1988). There are populations in the Pilot Rock ACEC, Oregon Gulch RNA, the Box-O Ranch, and in the oak woodlands on Agate Flat.

Clustered lady's-slipper (*Cypripedium fasciculatum*) is a Bureau Sensitive plant and a Survey and Manage species under the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* (ROD) and a candidate for listing with the State of Oregon under the Oregon Endangered Species Act. This plant is found east to the Rocky Mountains. Mid to late-successional forests with canopy closures greater than 60 percent appear to be the optimum habitat for this species. *Cypripedium fasciculatum* is a slow-growing, long-lived orchid with a mycorrhizal association and an arguable dependence on fire. Two populations of *C. fasciculatum* have been located in the proposed CSEEA. One vigorous population of 14 plants occurs in a mixed conifer-madrone stand on a steep slope above Emigrant Creek. The other population of 23 plants grow in a late mature Douglas-fir forest near the edge of a clearcut in the Lincoln Creek drainage. *Cypripedium fasciculatum* was also collected in 1923 at Johnson Prairie.

Bellinger's meadow-foam (*Limnanthes flocosa* var. *bellingeriana*) occupies a special habitat associated with high winter and spring water tables and impervious basalt subsoil layer. Soils are wet for three or more months of the year. Plants grow in or near the edges of vernal pools. This plant is a narrow endemic found on impervious basalt areas around the Poverty Flat ACEC (BLM Butte Falls Resource Area), in the vicinity of Lincoln, and at Oregon Gulch RNA. The site near Lincoln is of botanical importance as the type locality for the species (the place where the designated nomenclatural type was collected). Southworth and Seevers (1997) propose that Bellinger meadowfoam be returned to species status (*Limnanthes bellingeriana* Peck). Their conclusion is based on morphological evidence and the absence of intermediate forms when distributions were sympatric with woolly meadowfoam (*Limnanthes floccosa* var. *floccosa*).

Detling's microseris (*Microseris laciniata* ssp. *detlingi*) is a BLM sensitive species that is found only in Oregon. This plant is known only from Jackson County in the area of Siskiyou Pass in habitats of grasslands, meadows, rocky slopes, and forest edges.

Coralseed allocarya (*Plagiobotyrys figuratus* ssp. *corallicarpus*) in the CSEEA grows in an open vernal creek near Lincoln. The Lincoln population is unusual for its size, and isolation from other know populations at Sams Valley north of Medford. Interference with surface hydrology would put the population at risk.

Survey & Manage Plant Species

This group includes the vascular plants, bryophytes, lichens, and fungi. While lichens and fungi are no longer considered members of the plant kingdom, they have traditionally been classified as plants and are therefore addressed here. Occurrence data for bryophytes, lichens, and fungi has only been collected since 1997 with the survey requirements of the Northwest Forest Plan. General surveys have been conducted on the northern portion of the proposed CSEEA. Only small areas in the dryer and less forested southern portion of the CSEEA have been examined for bryophytes, lichens, and fungi.

Eight fungi, two lichens, one liverwort, and two vascular plant species (also Special Status Plant species) were found in the proposed CSEEA (table 2-11). All organisms,

Table 2-10. Special Status Plants Found within the CSEEA

Scientific Name	Common Name	Status*	TNC Rank*
Asarum wagneri	green-flowered ginger	W, SC	G4/S4
Astragalus californicus	California milk-vetch	T	G4?/SH
Calochortus greenei	Greene's mariposa lily	S, SC	G2/S2
Carex serratodens	saw-toothed sedge	A	G4?/S2
Cypripedium fasciculatum	clustered lady's-slipper	S, SC	G3G4/S2
Cypripedium montanum	mountain lady's-slipper	T	G4G5/S4
Fritillaria gentneri	Gentner's fritillary	S, FPE, SE	G1/S1
Fritillaria glauca	Siskiyou fritillary	A	G4/S2
Geranium oreganum	western geranium	T	-
Hackelia bella	beautiful stickseed	T	G4/S1
Hieracium greenei	Greene's hawksweed	T	G4/SU
Iliamna bakeri	Baker's globe mallow	A	G3?/S2
Isopyrum stipitatum	dwarf isopyrum	A	G4?/S2
Lathyrus lanszwertii var. *tracyi*	Tracy's peavine	A	G?T3/S1
Limnanthes floccosa ssp. *bellingeriana*	Bellinger's meadow-foam	S, SC	G4T2/S2
Microseris laciniata ssp. *detlingi*	Detling's microseris	S	G4T2/S2
Monardella glauca	pale monardella	T	G4G5/S?
Nemacladus capillaris	common nemacladus	A	G4/S1
Perideridia howellii	Howell's false-caraway	W	G4/S3
Plagiobothrys figuratus ssp. *corallicarpus*	coral-seeded allocarya	S, SC	G5T1/S1
Ribes inerme var. *klamathese*	Klamath gooseberry	T	G5T3?/SU
Solanum parishii	Parish's nightshade	T	G4/S?

*A = BLM Assessment species in Oregon G = Global rank SE = Oregon State endangered FPE = Federally proposed as endangered
S = BLM Sensitive species in Oregon T = Trinomial (subspecies, variety, race) rank S = State rank
SC = Oregon State Candidate W = BLM Watch species in Oregon T = BLM Tracking species in Oregon
1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation.
2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation).
3 = Rare, uncommon or threatened but not immediately imperiled. 4 = Not rare and apparently secure but with cause for long-term concern.
5 = Demonstrably widespread, abundant, and secure. ? = Not yet ranked or assigned rank is uncertain.

except one lichen, are associated with mid-mature to late-successional conifer forests. The one lichen is found on hardwoods in moist (riparian) to xeric conditions. In table 2-11, absence of The Nature Conservancy (TNC) rarity rating for most of the bryophytes, lichens, and fungi reflects a lack of information on species biology, distribution and ecological requirements.

Table 2-11. Survey and Manage Plants Found within the proposed CSEEA

Species	NFP Survey Strategy*	Taxa Group	TNC*
Bondarzewia mesenterica	1, 2, 3	fungus	G3/S1
Calicium viride	4	lichen	-
Cypripedium fasciculatum	1,2	vascular plant	G3G4/S2
Cypripedium montanum	1,2	vascular plant	G4G5/S4
Gyromitra esculenta	3, 4	fungus	-
Gyromitra montana	3, 4	fungus	-
Lobaria hallii	1, 3	lichen	-
Phlogiotis helvelloides	3, 4	fungus	-
Pithya vulgaris	1, 3	fungus	G4/S1
Plectania milleri	1, 3	fungus	G1/S1
Ptilidium californicum	1, 2, PB	liverwort	-
Sarcosoma mexicana	3, PB	fungus	-
Sarcosphaera eximia	3	fungus	-

*G = Global rank   S = State rank   T = Trinomial (subspecies, variety, race) rank

1 = Critically imperiled because of extreme rarity or because it is somehow especially vulnerable to extinction or extirpation.

2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (extirpation).

3 = Rare, uncommon or threatened but not immediately imperiled.

4 = Not rare and apparently secure but with cause for long-term concern.   5 = Demonstrably widespread, abundant, and secure.

Introduced Plants

Introduced (non-native or alien) plant species were brought to our area, accidentally or purposefully, from other countries or continents. Many introduced plants are harmless or beneficial. Others, that are not already invasive or noxious, have a high potential to become so in all or part of their range. Plants that have been determined to be noxious based on their negative environmental and/or ecological impacts have a special legal status that requires specific actions to eradicate them. In general, introduced plants are likely to invade or become noxious since they lack co-evolved competitors and natural enemies to control their populations. A few plants such as dandelion (*Taraxacum officinale*) have both introduce and native populations in the U.S.

Introduced plants can potentially displace native species, alter native plant and animal habitats, and alter ecological processes in plant and animal communities. They can compete with native species for water and nutrients, are often early and prolific seeders, and may produce fruits capable of long distance dispersal by various means, such as wind, water, or animal transport. Some are distributed by being caught-up in fur or hooves, clothes or Vibram soles, or by propagules in mud or vegetation that cling to motor vehicles (bumpers, wheel wells, tires) and can quickly spread to newly disturbed areas or even invade relatively undisturbed sites. Wind, generated by passing vehicles, helps spread weed seeds along roads.

Some introduced species can be desirable for reasons such as erosion control after disturbance while waiting for native species to gradually reestablish themselves. Some, such as timothy grass, are simply present and are relatively neutral; while others, such as the Himalayan blackberry, can quickly dominate and out-compete native species. Some species are poisonous to wildlife, livestock and humans. Non-native annual grasses can quickly dominate open woodlands, shrublands, and savannahs.

Generally, introduced species thrive under disturbed conditions. Large populations of exotic species are often present in open, disturbed areas at lower elevations; especially in dry meadows, oak and shrub communities, open pine savanna, and to a minor degree in wet meadows. Once disturbed, these communities are quickly invaded by non-native species from outside seed sources or the soil seed bank. Native grasses and forbs often have great difficulty competing with the non-native species that germinate in the fall and are able to out-compete the natives species for moisture in soils that are shallow or have limited moisture holding capacity.

Non-native species are rare in undisturbed coniferous mixed conifer or white fir forests at higher elevations except where canopy light gaps are created by roadsides, recreation sites, harvested timberlands, etc. However, several thistle species and mullein are common in disturbed areas at higher elevations. At higher elevations where low intensity fires have been suppressed and pre-historically had been the norm, aggressive non-native grasses may pose a problem as in attempts to create open "park-like" areas in stands of conifers.

Sedge and rush dominated wet meadows tend to be more resistant to an invasion by non-native species. However, species which are adapted to wet soils associated with ponds, ditches, or open riverine systems, such as portions of the Parsnip Lakes or Jenny Creek may occasionally become established.

Introduced plant species are common within the CSEEA (see Appendix D) and occur in all habitat types. Introduced plants are found in open plant communities (woodlands, shrublands, savannahs) and disturbed areas in the greatest number and density. Non-natives frequently dominate by these areas and some are considered noxious weeds.

Noxious Weeds

A few species introduced plants in the CSEEA are of particular interest because of their intensity impact on human welfare and the natural environment. These plants have been designated as Noxious Weeds by the Oregon State Weed Board. Noxious weeds are defined by the Weed Board as "[those plants] which are injurious to public health, agriculture, recreation, wildlife, or any public or private property." Noxious weeds have been declared a menace to public welfare (ORS 570.505) (Oregon Department of Agriculture, 1995).

Two statutory mandates guide the BLM in managing weeds on public lands. Section 302(b) of the Federal Land Policy and Management Act of 1976 directs the BLM to "take any action necessary to prevent unnecessary or undue degradation of the lands" (43USC 1732(b)). Section 2(b)(2) of the public Rangelands Improvement Act of 1978 adds that the BLM will "manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible..." (43 USC 1901(b)(2)).

Road building, historic overgrazing, and other disturbance activities have resulted in noxious weeds becoming established in the CSEEA. The three most common noxious weeds in the CSEEA are yellow starthistle (*Centaurea solstitialis*), Canada thistle (*Cirsium arvense*) (see map 14), and medusahead (*Taeniatherum caput-medusa*). Medusahead was not mapped because of its widespread distribution.

Yellow starthistle is associated with roads traversing the more open habitats. It has spread into relatively pristine areas from these establishment points. In the Scotch Creek Research Natural Area, yellow starthistle is common and becoming dominant in portions of the savannahs. Other areas where yellow starthistle is established are along the entire length of the Schoheim road and the Box-O Ranch.

Canada thistle is common along the roads in the area around Hobart Peak and Mill Creek. Canada thistle is an aggressive noxious weed and if left unmanaged, has the potential to form dense infestations. This plant's ability to propagate sexually and asexually gives it a competitive advantage over many of the plants occupying the same site.

Medusahead is the most common noxious weed in the CSEEA in terms of numbers and area covered. Many low elevation grasslands are infested. Grasslands on high clay content soils are particularly prone to invasion. Medusahead forms a heavy, high silica thatch that retards or prevents germination of native species, and may become a fire hazard.

Dyer's woad (*Isatis tinctoria*), while not widespread in the CSEEA, is of special concern because of its ability to spread rapidly and invade undisturbed sites. In the Pacific Northwest, it is estimated that dyer's woad is spreading at an annual rate of 14 percent on BLM rangeland (USDI 1986).

Table 2-12 lists the noxious weeds known to occur in the CSEEA. It is primarily based on the 1996-1998 Medford District noxious weed surveys and rare plant surveys performed in the 1990s.

Table 2-12. Noxious Weeds in the CSEEA

Scientific Name	Common Name	List*
Centaurea diffusa	diffuse knapweed	B
Centaurea maculosa	spotted knapweed	B
Centaurea pratensis	meadow knapweed	B
Centaurea solstitialis	yellow star-thistle	B, target
Cirsium arvense	Canada thistle	B
Cirsium vulgare	bull thistle	B
Convolvulus arvensis	field bindweed	B
Cuscuta pentagona	dodder	B
Equisetum arvense	common horsetail	B
Hypericum perforatum	klamathweed	B
Isatis tinctoria	dyer's woad	B
Linaria dalmatica	dalmatian toadflax	B
Taeniatherum caput-medusae	medusahead	B

*State of Oregon Noxious Weed List

"B" designated weeds are weeds of economic importance that are regionally abundant but may have limited distribution in some counties.

Forest Health

Native CSEEA vegetation is a result of time, the unique geology of the area, and anthropogenic influences (human-caused fires for land clearing, hunting, mining, grazing, protection and food, mining, logging, and other factors related to urbanization). Over thousands of years, native inhabitants regularly used fire on the landscape for a wide variety of purposes. Natural disturbance such as lightning fires, windstorms, pathogens and drought contributed to the variation. The lower elevation areas were probably dominated by grassland, oak savanna, and open oak/pine woodland. In the upper valley/canyon area prime oak woodland probably existed. Many of the canyon and high plateau mixed-conifer stands were comparatively open, with a higher proportion of mature ponderosa and sugar pine than at present. Infrequent, stand-replacing natural fires on the high plateau may have played a dominant role overall. Due to the frequent disturbance regime, historic (pre-European) forest lands were generally more open, had fewer trees per acre, trees of larger diameter, and a different species composition.

Table 2-13 lists current general vegetation types and conifer seral stages found in the CSEEA (see map 16 for seral stage distribution).

Some stands within the CSEEA have been previously harvested. Natural mortality has also created openings in the canopy layer. Natural mortality is a result of disturbance agents, i.e. root rot diseases, bark beetles and windthrow. The understory of many stands consists of dense pockets of conifer regeneration and shrubs. The regeneration ranges from seedlings to small pole size trees. Many of these trees are suppressed and would benefit from thinning. Many of the stands in the area have vertical stand structure with occasional older trees scattered throughout the stands. Most mid and mature condition class forest stands have a closed canopy, high stocking levels, and many suppressed trees. Some forest stands have been selectively logged, commercially thinned or have died from natural disturbance. These stands tend to have more diverse species composition and vertical structure.

Subtle changes in species composition and stand structure are occurring over the landscape. Some trees with old-growth characteristics are dying as a result of increased competition with second growth trees for limited resources. White fir, the most shade tolerant tree species in the CSEEA, is replacing Douglas-fir, ponderosa pine, sugar pine

Table 2-13. General Vegetation Stand Types in the CSEEA

Stand Condition Types	Percent
Grassland	13%
Shrubland	10%
Hardwood/Woodland	24%
Conifers Forests	
Early seral (< 5" diameter)	<1%
Small pole (5-11"diameter)	4%
Mid seral (11-21"diameter)	15%
Mature/old growth (over 21"diameter)	34%

and incense cedar because of its more shade-tolerant nature. Douglas-fir is encroaching upon the edges of the oak woodlands. Mortality of Douglas-fir along these edges has been noticeable during drought years. Shrubs and hardwood trees beneath the dominant tree canopy layer are dying in the mid-size vegetation condition class.

Conifer Forest Disturbance Agents

The activities most likely affect overall forest health are timber harvest (thinning) and prescribed fire. These activities change forest structural characteristics at the time of treatment. Disturbance agents are constantly at work at the stand and landscape level. Disturbance agents will have various impacts depending on successional stages and plant communities effected. Management activities may shift the relative impact of disturbance agents to historic levels over time and over the landscape. The main disturbance agents described below are intended to show their relative impacts on the forest plant communities.

Forest Insects and Disease

Insects and pathogens, often predictable agents of change, are currently present in the proposed CSEEA and surrounding areas. These agents can decrease growth and cause mortality in individual trees acting individually or together. At the landscape level, they influence stand structure, composition, and function within forest ecosystems by creating canopy gaps, altering plant succession, creating decay columns and snags, which contribute woody material to the forest floor and streams. Insect and disease influences may be beneficial or detrimental to development and maintenance of late-successional or old-growth conditions, depending upon the mix of hosts, insects, and pathogens; current weather patterns; fire history; host species composition; host vigor; and past management activities.

Laminated root rot, caused by *Phellinus weirii* (Basidiomycota), is the most damaging tree disease in the proposed CSEEA. This disease is found on at least 3,000 acres of mixed conifer and white fir forest lands with a mix sugar pine and incense cedar and a white fir understory. On some sites, large, individual sugar pine have survived for 600 years, while generations of surrounding Douglas-fir and white fir grew, matured and then, succumbed to laminated root rot.

Laminated root rot has always been present at some level on these sites for centuries. Good examples of the establishment of shade intolerant pine and incense cedar in gaps caused by the death of firs by laminated root rot are found in the Chinquapin Mountain, Hyatt Lake, Yew Springs and Crane Prairie areas. Here, laminated root rot causes extensive growth declines, decay, and mortality among susceptible white fir and Douglas-fir. Lodgepole pine and sugar pine are tolerant, while ponderosa pine and incense cedar are resistant. Approximately 400 acres of late-successional forest in the area with laminated root rot were clearcut and planted to pine plantations. Eighty years of fire suppression has caused a shift to dense stands of more intolerant white fire and Douglas-fir that stress the older pines and cedars. The last stand replacing wildfire event in this area was in 1910.

Heterobasidion annosum (Basidiomycota) causes Annosus root disease which damages white fir in the proposed CSEEA. Several incidences of *Annosus* root rot have been noted in cut over areas where it has colonized stumps from previous stand entries and infected conifer regeneration in the vicinity. Infection occurs when roots from healthy trees contact with infected root material. Ten or twenty years after timber harvest, a significant proportion of the associated stand and subsequent reproduction shows a large proportion of *Annosus* infection in the form of butt rot, windthrow, and stem breakage.

Other root or butt rot diseases observed in the area include shoestring root rot (*Armellaria mellea*) and velvet top (*Polyporous schweinitzii*). Black stain root disease (*Verticicladiella wagenerii*) was observed in 1986. No reported infection centers were observed on Douglas-fir or ponderosa pine because few Douglas-fir plantations of the age class (10-30 years) are found in the proposed CSEEA due to severe frost problems associated with clearcuts.

White pine blister rust on sugar pine is caused by *Cronartium ribicola* introduced from Europe around 1910. It causes topkill and flagging of small branches on large trees and mortality of poles, saplings, and seedlings due to girdling cankers. To date, of 50 sugar pine tested within the LSR, 29 have shown resistance. Seedlings from resistant parents are planted in partial cut stands and gaps. Significant sugar pine mortality has been observed on seedlings and saplings in several areas within the proposed CSEEA particularly in the Jenny Creek LSR.

Sugar pine mortality is significantly altering future forest structure. Normally sugar pine seeds into gaps in mixed conifer stands. Presently, young sugar pine occupy these sites but die and are replaced by incense cedar, white fir, and Douglas-fir instead. .

Common heart rot or decay column causing pathogens include *Polyporous amarus* on incense cedar, *Phellinus pini* on Douglas-fir, and *Echinodontium tinctorium* on white fir. These necessary and beneficial fungi create habitat used by cavity nesters and dwellers. Heart rots usually do not cause mortality because they grow for decades with the maturing tree, forming cavities that provide nesting habitat for decades in late-successional stands.

Several primary tree killing insects are present in the proposed CSEEA: western pine beetle (*Dendroctonus brevicomis*) on ponderosa pine; mountain pine beetle (*D. ponderosae*), red turpentine beetle (*D. valens*) and pine engravers (*Ips spp.*) on sugar and ponderosa pine; Douglas-fir beetle (*D. pseudotsugae*) on Douglas-fir; and fir engraver (*Scolytus ventralis*) on white fir. Recently insect species associated with pine have significantly affected large old trees due to stress associated with dense stocking of white fir in the understory and drought. Sugar pine and ponderosa pine are being lost in many areas within the CSEEA as a result of increased competition by white fir and subsequent insect attacks. Blister rust on sugar pine exacerbates insect attack. Fir engraver activity associated with root rots is another example of trees being predisposed to insect outbreaks due to an existing stress problem. See map 17 for insect incidence 1995-1998. Historic references record major beetle infestations from 1925 to 1934. Periodic and local infestations continue to occur over the area.

Dwarf mistletoe on Douglas-fir and white fir is common. The most significant impacts on the growth and survival occur in multi-storied Douglas-fir stands where partial cutting and fire exclusion have created uneven-aged stands resulting in higher infection levels and increased occurrence of Douglas-fir mistletoe (*Arceuthobium douglasii*). It is recognized by its aerial shoots accompanied by host stem swelling and multiple branching pattern called witches broom. Some level of dwarf mistletoe in a stand is desirable for future old-growth tree character and structure, as well as spotted owl habitat. Douglas-fir in particular develops brooms, which are important to wildlife. The large brooms that form over the course of several years on large old-growth trees are desirable habitat and irreplaceable in the short term. Development of old-growth character from heavily infected trees in an overstocked understory is unlikely due to infection of the actively growing tops on small to intermediate sized trees. Historically, many of the smaller infected trees were removed from stands by wildfires. Presently, infected understory trees act as fuel ladders that increase the likelihood of destroying larger overstory stand components. Areas in the CSEEA, such as Fredenburg Springs, are good examples of the fuel ladder problem.

Winds

High winds periodically cause windthrow in managed forest stands and natural stands. Blowdown is common on ridges especially when soils are saturated. Trees that are shallow rooted as result of high water tables have increase susceptibility to windthrow during storms, particularly where the stand has been recently thinned. Heavy snowfall accompanied by high winds during severe winter storms result in increased tree breakage and windthrow of white fir and other tree species. The most severe blowdown problems in the proposed CSEEA in recent history have been due to heavy thinning in shelterwoods. Clearcutting has exposed forest stand edges to direct wind resulting in increased blowdown. Open areas in rugged terrain exacerbate wind tunnel circumstances wherein windthrow at the edges of intact forest stands gradually erodes stand integrity. All of these situations contribute to fragmentation of intact forest communities.

Animal Influences

Most animal problems in the proposed CSEEA are associated with favorable habitat conditions created as a result of historic clearcutting. Only incidental problems have been noted in late-successional forests.

Pocket gophers (*Thomomys sp.*) pose the most significant animal reforestation problem in conifer forests in the proposed CSEEA. Historic clearcutting practices have converted old-growth or late-successional forests to grass and fields. This creates ideal gopher habitat. Coupled with severe frost the only reforestation option is to plant lodgepole, Jeffrey and ponderosa pine. These are the only species that can survive successfully in what is now an early seral community. Heavy gopher predation typically causes mortality of pine seedlings for up to five years and sometimes longer. Mortality has been as high as 90 percent of stocking in a single year. Gophers prefer fleshy or succulent roots and stems of herbaceous plants and trees, injuring tree seedlings by root pruning, stem girdling, and stem clipping. Replanting has been normal procedure on these sites. Gopher population control methods include baiting with poison, trapping, and plowing. Success has been limited because gopher populations fluctuate rapidly due to weather, altitude, soil characteristics, and food quality and quantity. Porcupine populations have increased with increased acreage of pine plantations. Porcupines continue to girdle and top kill pines to 40 years of age at a detrimental level. Reforestation and young stand management is extremely difficult after clearcutting at the high elevations white fir and mixed conifer communities that characterize the Jenny Creek LSR.

Gophers provide food for a host of small and medium-sized predators, including spotted and great grey owls, coyote, and various snakes and weasels. They are suspected to play a role in maintenance of vernal mound topography outside late-successional old-growth communities.

Deer and elk often nip buds and browse conifer seedlings or saplings, slowing down tree establishment in the process. Generally, native ungulates are not a large problem in this area. Cattle are a problem only in small areas where they congregate for shade and water. They are a positive factor in decreasing grass competition in pine plantations older than 4 to 5 years where trees are too large to be trampled. Overall, cattle are not a significant reforestation problem.

Timber Harvest

The first timber harvesting in the CSEEA occurred around the turn of the century with economic selection for the best quality old-growth trees (Larsen 1976). The Oregon and

Table 2-14. Estimated Gross Timber Volumes in proposed CSEEA			
Location in CSEEA	**Volume (MMBF)**	**Location in CSEEA**	**Volume (MMBF)**
WSA (matrix)	59.550	WSA (LSR)	2.871
Pilot Rock (matrix)	4.170	Jenny Creek ACEC (LSR)	0.306
Scotch Creek (matrix)	3.207	Oregon Gulch RNA (LSR)	8.305
Available (matrix)	67.847	Other LSR	131.461
Spotted Owl Core (matrix)	4.024		
Total Matrix Volume	**138.744**	**LSR Total Volume**	**142.943**
CSEEA Total Timber Volume			**281.711**

MMBF =million board feet

California Revested Lands Sustained Yield Act of 1937 established timber harvest as the primary use of BLM forest lands in western Oregon.

Large scale salvage logging, partial harvests, and selective logging began in the 1940s. During the 1950s and 1960s, clearcuts and group selection harvests were common. By the 1970s, logging practices had shifted to more and larger clearcuts. Two-step shelterwood and salvage cutting was also practiced. Virgin old-growth and late-successional forests were often entered in the form of developmental sales that were planned in order to enter an "undeveloped" area while doing mortality salvage harvests to establish road systems for future sales. The 1980s saw a continued increase in clearcutting despite recognized problems with reforestation as a result of these practices (Minore 1978).

Many of the timber sales that involved significant liquidation of late-successional forests occurred in the Chinquapin Mountain, Beaver Creek, and Lincoln Creek areas in the late 1980s. Most of these forests are currently even-aged pine plantations. Clearcutting on private lands both within and adjacent to the CSEEA have resulted in removal of whole sections that were previously late-successional forests. These are now pine plantations. Private lands continue to be clearcut today. Forests that were not clearcut were often entered too heavily to continue functioning as acceptable habitat for old-growth species. South of Keene Creek Ridge and Pilot Rock cutting has been minimal compared to the areas to the north. Table 2-14 lists estimated gross volume of timber currently in the CSEEA.

Fuels

For a description of the existing condition for Jenny Creek Late-Successional Reserve outside the Alternative A (RMP) boundary for the Cascade Siskiyou Ecological Emphasis Area (CSEEA), refer to the existing condition chapter in the *Jenny Creek Late-Successional Reserve Assessment*.

Wildfire History

Fire is recognized as a key natural disturbance process throughout Southwest Oregon (Atzet and Wheeler 1982). Human-caused and lightning fires have been a source of disturbance to the landscape for thousands of years. Native Americans influenced vegetation patterns for over a thousand years by igniting fires to enhance values that were important to their culture (Pullen, 1995). Early settlers to this area used fire to improve grazing and farming and to expose rock and soil for mining. Fire has played an important role in influencing successional processes. Large fires were a common occurrence in the area based on fire scars and vegetative patterns and were of varying severities.

Climate and topography combine to create the fire regime found throughout the CSEEA. Fire regime refers the frequency, severity and extent of fires occurring in an area (Agee 1991). Vegetation types are helpful in delineating different fire regimes. Three broad fire regimes within the CSEEA were identified using vegetation types as a basis for fire regime delineation, . These regimes are based on the effects from fire on the dominant vegetation. Refer to map 18 for the location of these fire regimes on the landscape.

Low-Severity Regime

This regime is characterized by vegetation types such as grasslands, shrublands, hardwoods and mixed hardwood, and pine which are similar to the Interior Valley Vegetative Zone of Franklin and Dyrness (1988). These plant communities recover rapidly from fire and are directly or indirectly dependent on fire for their continued persistence. The dominant trees within this regime are adapted to resist fire due to the thick bark they develop at a young age. A low-severity regime is characterized by nearly continual summer drought; fires are frequent (1-25 years), burn with low intensity, and are widespread. Approximately 64 percent of the CSEEA falls into this category.

Moderate-Severity Regime

This regime is associated with the Mixed Conifer Vegetative Zone of Franklin and Dyrners (1988). Approximately 33 percent of the CSEEA is categorized in this regime. This regime is characterized by long summer dry periods; fires are frequent (25-100 years). It is the most difficult to characterize and is often located in a transitional position between low and high elevation forests or plant communities. Fires burn with different degrees of intensity within this regime. Stand replacement fires as well as low intensity fires can occur depending on burning conditions. The overall effect of fire on the landscape in this regime is a mosaic burn.

High-Severity Regime

This regime is characterized by the White Fir Vegetation Zone (Franklin and Dyrness, 1988). This environment is characterized by moist, cool conditions with infrequent fires. Accurate fire return intervals have not been calculated because of the long intervals between fires. When fires occur, they are due to unusual conditions, such as drought periods associated with high winds. Fires are of high intensity and normally are stand replacement fires. Approximately 3 percent of the CSEEA is in this fire regime.

Table 2-15 displays the fire regimes represented in the designated special management areas within the Cascade Siskiyou Ecological Emphasis Area.

In the early 1900s, uncontrolled fires were considered to be detrimental to forests. Suppression of all fires became a major goal of land management agencies. From the 1950s to present, suppression of all fires became efficient because of an increase in suppression forces and improved techniques. As a result of the absence of fire, there has been a build-up of unnatural fuel loadings and a change to fire-prone vegetative conditions.

Table 2-15. Fire Regimes in Special Management Areas within the proposed CSEEA			
Special Areas	**Low Severity Regime**	**Moderate Severity Regime**	**High Severity Regime**
Jenny Creek ACEC	94%	6%	0
Pilot Rock ACEC	38%	62%	0
Mariposa Lily Reserve	100%	0	0
Scotch Creek RNA	80%	20%	0
Oregon Gulch RNA	68%	32%	0
Soda Mountain WSA	70%	29%	1%
Box-O Ranch	94%	6%	0
Jenny Creek LSR	55%	39%	6%

Based on calculations using fire return intervals, five fire cycles have been eliminated in the southwest Oregon mixed conifer forests that occur at low elevations (Thomas and Agee 1986). Species, such as ponderosa pine and oaks, have decreased. Many stands, which were once open, are now heavily stocked with conifers and small oaks which has changed the horizontal and vertical stand structure. Surface fuels and laddering effect of fuels have increased, which has increased the threat of crown fires which were once historically rare.

Many seedling and pole size forests of the 20th century have failed to grow into old-growth forests because of the lack of natural thinning once provided by frequent fire. Frequent low intensity fires serve as a thinning mechanism, thereby, naturally regulating the density of the forests by killing unsuited and small trees. Consequently, much old-growth forest habitat has been lost along with diminished populations of old-growth dependent and related species. In addition, ponderosa pine trees that thrive in fire prone environments are quickly shaded out by the more shade tolerant Douglas-fir or white fir species in the absence of fire. As a result, some late-successional forests have undergone a rapid transition from ponderosa pine stands to excessively dense true fir stands. Trees growing at lower densities, as in ponderosa pine stands, tend to be more fire-resistant and vigorous. Eventually they grow large and tall, enhancing the vertical and structural diversity of the forest. Some populations of organisms that thrive in the more structurally diverse forests that large trees provide are becoming threatened.

Many forests developed high tree densities and produced slow growing trees rather than faster growing trees after abrupt fire suppression became policy in about 1900. Trees facing such intense competition often become weakened and are highly susceptible to insect epidemics and tree pathogens. Younger trees (mostly conifers) contribute to stress and mortality of mature conifers and hardwoods. High density forests burn with increased intensity because of the unnaturally high fuel levels. High intensity fires can damage soils and often completely destroy riparian vegetation. Historically, low intensity fires often spared riparian areas, which reduced soil erosion and provided wildlife habitats following the event.

The absence of fire has had negative effects on grasslands, shrublands, and woodlands. Research in the last few decades has shown that many southern Oregon shrub and herbaceous plant species are either directly or indirectly fire-dependent.

Several shrub species are directly dependent on the heat from fires for germination - without fire, these stands of shrubs cannot be rejuvenated. Grass and forbs species may show increased seed production and/or germination associated with fire.

Indirectly fire-dependent herbaceous species are crowded out by larger-statured and longer-lived woody species. This is particularly so for grasses and forbs within stands of wedgeleaf ceanothus and whiteleaf manzanita with a high canopy closure. High shrub canopy closure prevents herbaceous species from completing their life-cycle and producing viable seed. Many grass species may drop out of high canopy shrub lands in the absence of fire because of their short-lived seed-bank.

Fire history recorded over the past 20 years in Southwest Oregon (outside the CSEEA) indicate a trend of more large fires which burn at higher intensities in vegetation types associated with low-severity fire regimes and moderate-severity fire regimes. This trend is also seen throughout the western United States. Contributing factors are the increase of fuel loading due to the absence of fire, recent drought conditions, and past management practices.

Fire Risk

Risk is the probability of when a fire will occur within a given area. Historical records show that lightning and human caused fires are common in the proposed CSEEA. Activities within this area such as established campgrounds, dispersed camp sites, recreational use, and major travel corridors add to the risk component for the possibility of a fire occurring from human causes. The time frame most conducive for fires to occur in the proposed CSEEA is from July through September.

Information from the Oregon Department of Forestry database from 1967 to 1998 show a total of 129 fires occurred throughout the proposed CSEEA. Lightning accounted for 55 percent of the total fires started. Of these fires, 101 were less than 0.25 acres in size (Class A fire), 24 were about an acre in size and the remaining 4 fires were between 1 and 400 acres in size. Fire data previous to 1967 is not available.

Fire history data was used to assess fire risk for the proposed RMP CSEEA boundary. This risk assessment utilized the total number of fire starts over a given period of time for the CSEEA. The derived value corresponds to the likelihood of fire starts per 1,000 acres per decade. Results show that the Cascade Siskiyou Ecological Emphasis Area is in the low fire risk rating. See Appendix E for information regarding the fire risk rating calculation and more specific information regarding past fires within the CSEEA.

Fire Hazard

Fire hazard assesses vegetation by type, arrangement, volume, condition and location. These characteristics combine to determine the threat of fire ignition, the spread of a fire and the difficulty of fire control. Fire hazard is a useful tool in the planning process because it helps in prioritizing watersheds and areas within a watershed in need of fuels management treatment.

Hazard ratings were developed for the CSEEA. Map 19 shows the location of the different fire hazard ratings within the area. Table 2-16 summarizes the percent acres in each fire hazard rating category.

Table 2-16. Fire Hazard Ratings for the proposed CSEEA

Fire Hazard Rating	Percentage of Acres in each Category
Low hazard	1%
Moderate hazard	57%
High hazard	42%

Reference Appendix K in the *Jenny Creek Late-Successional Reserve Assessment* for a description of how fire hazard was determined.

Fire Suppression

The Bureau of Land Management has a master cooperative fire protection agreement with the Oregon Department of Forestry (ODF). This agreement gives the responsibility of fire protection of all lands within the CSEEA to the Oregon Department of Forestry. This contract directs ODF to take immediate action to control and suppress all fires. Their primary objective is to minimize total acres burned while providing for fire fighter safety. The agreement requires ODF to control 94 percent of all fires before they exceed 10 acres in size.

Due to ownership patterns and political constraints in southwest Oregon, the use of wildfire to meet resource objectives is not possible. There are stipulations within the protection agreement with ODF that allows BLM to designate areas that require special fire management activities during suppression efforts. It is recognized that restrictions could increase the cost of suppression which the Bureau of Land Management would incur and would require a modification of the contract.

Within the CSEEA, several areas have been designated requiring suppression methods that encourage minimal impacts in order to assure that damage to all unique habitat is minimized. Maps identifying these areas, which limit certain suppression activities, are made available to suppression forces before the start of each fire season. Areas of special concern which require specific fire suppression tactics or limit tactics within the Cascade Siskiyou Ecological Emphasis Area are in Appendix F.

Prescribed Fire

Prescribed fire is a management activity allowed within the CSEEA. Prescribed fire can be used to meet resource management objectives which include but are not limited to wildfire hazard reduction, restoration of desired vegetation conditions, management of habitat and silvicultural treatments. All fuel treatments will meet Aquatic Conservation Strategy and riparian reserve objectives. Records indicate that prescribed fire within the CSEEA has occurred only once, in 1982. This burn was located in T.41S.,R.2E., Sections 3, 4, 9, and 10.

When utilizing prescribed fire in Areas of Critical Environmental Concern (ACEC) and Research Natural Areas (RNA), it should be based on the fire history of the area and past vegetation patterns known for the area. The application of prescribed fire should closely approximate the frequency, intensity, size, and the "natural" season of fire when possible. For guidelines on the use of prescribed fire in the Jenny Creek Late-Successional Reserve, refer to Chapter 4 of the *Jenny Creek Late-Successional Reserve Assessment*.

The Fire Management Plan for the Soda Mountain Wilderness Study Area allows the use of prescribed fire within the WSA. It states "prescribed fire, resulting from planned ignitions, shall be permitted in the Soda Mountain WSA to maintain the natural condition of a fire dependent ecosystem." The intent of prescribed fire within the WSA is to reintroduce the natural process of fire. The Fire Management Plan for the Soda Mountain Wilderness study area can be found in Appendix G.

Wildlife

Terrestrial Wildlife

The proposed CSEEA is becoming increasingly well known for it's biological diversity. Estimates of known and suspected numbers of vertebrate species present vary depending on the source. There are 138 species of birds confirmed (Trail 1999a). Nelson (1997) lists seven species of amphibians, 16 species of reptiles and 61 species of mammals as known or suspected to occur in the area. These numbers pale in comparison to the invertebrate diversity present in the area. The proposed CSEEA hosts one of the richest butterfly faunas in the western U.S. [with 81 documented species and the possibility of an additional 26 (Runquist 1999)]. This species richness, across taxa, results in unusual assemblages of species. This area is a mixing zone where "eastside" species such as pygmy nut hatch and kangaroo rats share habitats with rough skinned newts and northern spotted owls. This species richness reflects the diversity of habitats found in the area. For a more detailed description of the vegetative diversity of the analysis area refer to the Vegetation section.

Twenty-nine "special status" vertebrate species, six "special status" terrestrial invertebrate wildlife species (all mollusks) are known or suspected to occur in the area and will be discussed below. The CSEEA provides important habitat for deer and elk. These game animals will be addressed in this section as well.

Special Status Species

Special Status Species (SSS) include those species that are listed as threatened or endangered, are proposed for listing as threatened or endangered, or are candidates for listing as threatened or endangered by the U.S. Fish and Wildlife Service, under the Endangered Species Act (ESA) of 1973, as amended. Also included are those species listed by the BLM as sensitive and assessment species. For this analysis, those species identified in the *Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (FSEIS) Record of Decision (ROD)* for protection by Protection Buffers and Survey and Manage strategies will also be addressed as SSS. By definition, these species are in a "red flag" category. Range-wide inventory and monitoring is needed to better assess habitat needs and population status of many of these species; particularly those that are not presently listed under the ESA. Special management may be necessary at the local level to ensure long-term population viability.

Birds

Bald Eagle *(Haliaeetus leucocephalus)*

Bald eagles nest on Hyatt Lake and Howard Prairie Reservoir just outside of the analysis area. No known nests occur in the analysis area. Surveys for new nests and reproductive success at known nests occur annually at Hyatt Lake and Howard Prairie Reservoir. This species is currently listed as threatened under the Endangered Species Act, but is currently being considered for de-listing by the USFWS. Bald eagles can occasionally be seen in the analysis area particularly in the northern areas by the lakes. They have also been seen in the lower Jenny Creek area. The fish populations in Jenny Creek are probably too small to support a bald eagle nest down stream from the lakes but there has been an unsubstantiated report of a nest near the California Jenny Creek Falls segment.

The Medford District Resource Management Plan specifies that a block of suitable habitat at least 30 acres in size be designated for future population expansion near the shoreline of Hyatt Reservoir. This block will be officially designated before any actions that might limit selection options are undertaken. This habitat block could be selected from the lands in the CSEEA depending on which alternative is selected in this EIS.

Peregrine Falcon (*Falco peregrinus*)

The Peregrine falcon has recently been de-listed by the USFWS. However, protection of known nesting sites is still required. There are no known nest sites in the proposed CSEEA.

Several reported sightings of Peregrines have been recorded around prominent rocks and cliffs in the CSEEA analysis area. There have been reported sightings of peregrine falcons in the Jenny Creek canyon. The cliffs along the rim of lower Jenny Creek canyon, Hobart Bluff, Pilot Rock and "Cathedral Cliffs" provide potential nesting habitat. Lower Jenny Creek canyon was inventoried for peregrine falcons in 1992 and 1994. No peregrines were observed. Hobart Bluff, Pilot Rock, and the "Cathedral Cliffs" have all been checked for occupancy over the years using various methods and intensities of observation.

Hobart Bluff has a high traffic road running past the base of the cliff and there is a branch trail off of the PCNST that goes to the top of the cliff; both of these attributes detract from the suitability of the site. Pilot Rock is subject to substantial recreational use both for sight seeing and rock climbing. The disturbance resulting from this recreational use detracts from the suitability of the site for nesting. Cathedral Cliffs and the lower Jenny Creek canyon receives much less human disturbance due to their remote locations and difficult access.

The Peregrine falcon population in the northwest is experiencing increases with new nest sites found annually. It is possible that some of the above listed sites could be used by this species in the future.

Lewis' Woodpecker (*Asyndesmus lewis*)

Lewis' woodpecker is a Bureau assessment species. This species is found most commonly in the Interior Valley Zone plant communities. This species is closely associated with mature oak woodlands and oak savannah habitat. Lewis' woodpeckers in the CSEEA analysis area are believed to represent a wintering population. There may be some nesting by this species, but there is no data to indicate breeding in the analysis area. They were not found by Alexander (1999) during his breeding bird surveys.

Greater Sandhill Crane (*Grus canadensis*)

The greater sandhill crane is a Bureau assessment species. Primary habitat for both nesting and foraging is wet meadows. There have been a number of sightings of this species in the meadows and grasslands near Hyatt Lake, Howard Prairie reservoir, also at Johnson Prairie (just outside the analysis area) and Fredenberg Springs (inside the analysis area), but there has not been confirmed nesting within the analysis area. There has not been any systematic inventory for greater sandhill cranes in the LSR.

Northern Saw-whet Owl (*Aegolius acadicus*)

Primary habitat of this Bureau assessment species is dense conifer forest intermixed with meadows in the Mixed conifer and white fir communities. Little is known about this owl in the analysis area. Some have been aurally and visually detected coincidentally with inventories for northern spotted owls.

Western Meadowlark (*Stunella neglecta*)

The western meadowlark is a Bureau assessment species which is occasionally observed in the analysis area. Primary habitat in southwest Oregon is large natural meadows and grasslands. Little is known about population trend in the analysis area. Population trend range-wide is decreasing. This is believed to be mostly due to habitat loss resulting from suburban development.

Western Bluebird (*Sialia mexicana*)

The western bluebird is a Bureau assessment species found throughout the analysis area. Primary habitat is naturally occurring open areas or early seral conifer forest. Little is known about population trends within the analysis area. This species is impacted throughout its range by introduced competitors such as the European starling and English Sparrow. Natural nest sites for bluebirds are cavities in trees and snags occurring in open areas. The introduced competitors can out compete the bluebirds for nesting sites, and to some degree food. Human developments such as barns, livestock handling areas and disturbed sites often attract the introduced competitors. After they are established around human habitation the competitors can spread to the surrounding wildlands. A number of nest boxes to encourage western bluebirds nesting have been erected in the Jenny Creek watershed particularly the Box-O Ranch over the last few years. Surveys to establish their effectiveness have not been conducted.

White Pelican (*Pelicanus erythrorhynchos*)

The white pelican is a Bureau assessment species. It has been observed in various sized groups on Hyatt Reservoir (just outside the proposed CSEEA) for approximately the past six summers. Little is known about this summer population other than that it is non-breeding and assumed to be from the Klamath basin. The pelicans remain for a relatively short time, several weeks to a couple of months.

Northern Spotted Owl (*Strix occidentalis caurina*)

The Northern Spotted owl is listed as a threatened species under the ESA. We know much more about this species and its habitat than most others present in the proposed CSEEA. The Jenny Creek LSR has 17 known spotted owl pair sites as defined by the Interagency Spotted Owl Protocol. There are an additional 4 sites within the proposed CSEEA analysis boundary but outside the LSR.

Since the late 1980s, almost all of the adult spotted owls on the Ashland Resource Area have been captured and individually marked with a plastic band of a site-specific color and/or pattern. These birds are also marked with unique numbered USFWS aluminum bands. Most of the juvenile owls produced have also been captured and marked with a standard color "juvenile band" and a USFWS band. Many birds were banded prior to 1990 although there was no effort to catch and band every spotted owl at every site. Since 1990, the policy of banding adults and juveniles was in effect until approximately 1995 across the resource area and has largely been applied to the proposed CSEEA to date. This has allowed BLM to track movements of individual adults and juvenile owls.

Northern spotted owls are generally associated with late-successional coniferous forests, which are characterized by large trees, multi-layered canopies, and a high degree of canopy closure. It is largely due to concerns about the long-term viability of the northern spotted owl that the LSR land allocation was created.

The ROD directed that 100 acres of the best, most contiguous spotted owl habitat on BLM lands around each of the spotted owl pair sites known as of January 1, 1994 in the Matrix land allocation be identified and managed as a "core area" of habitat. These cores were given the designation Unmapped Late-Successional Reserve in the ROD.

These core areas retain this designation into perpetuity regardless of the presence or absence of spotted owls in the future. As these areas were being identified in the Matrix, 100 acres was also identified for each known pair site in the LSR as well. There are currently 21 known spotted owl sites in the CSEEA analysis area, of which 18 are in the LSR.

Current and Potential Spotted Owl Habitat within the proposed CSEEA.

Federal Lands

In 1992, the Ashland Resource Area completed a 100 percent inventory and classification of all resource area lands as to their current suitability and potential for future suitability for use by spotted owls. The information sources for this classification were as follows:

- operations Inventory data from the BLM Micro*storms system,
- aerial photographs,
- biologists' personal knowledge of the stands
- field checks of questionable stands

Every stand on BLM land was placed into one of the six possible habitat categories (Table 2-17). The Medford District BLM modified the McKelvie Habitat rating system by dividing two of its habitat types for a total of six instead of four types.

Because the original classification was completed eight years ago, some stands needed to re-classified due to management actions that occurred after the original analysis. Biologists examining the stands in question accomplished the reclassification.

Private lands were not included in the habitat classification because inventory data on those lands was not available. Map 20 shows BLM owl habitat types in and around the CSEEA. Habitat type descriptions are immediately below table.

Table 2-17. Current habitat amount* (in acres) in the proposed CSEEA

	Type 1	Type 2	Type 3	Type 4	Type 5	Type 6
In DDR	0	11	10	53	268	0
In LSR*	3,220	7,401	3,213	12,257	7,591	800
In Matrix**	466	2,053	549	12,926	1,114	470
In RNAs	0	236	45	2,408	53	24
In ACECs	66	460	139	393	97	107
Critical Habitat Unit OR-38	236	6,848	2,823	10,273	6,975	627

* Before boundary changes proposed in LSR assessment.

** Does not include Box-O (1,200) or Mariposa Preserve (240) acres. These areas were not been typed.

Habitat type definitions for Table 2-17:

Type 1: Nesting: (optimal-meets all spotted owl life requirements). Canopy closure greater than 60 percent and canopy structure multi-layered. Overstory trees greater than 21" dbh. Deformed, diseased, and broken top trees present. Large snags and down logs present. This is the best approximate we have for "old-growth" for planning purposes. This category is considered late-successional.

Type 2: Roosting/Foraging: (meets requirements for spotted owl roosting, foraging and dispersal). Canopy closure usually greater than 60 percent, with generally single layer structure. Overstory trees greater than 16" dbh. Snags and down wood less prevalent than #1; may be very little. This is the best approximate we have for "mature"stands for planning purposes. This category is considered late- successional.

Type 3: Potential Habitat Only: (meets no known spotted owl needs currently). Canopy closure less than 40 percent due to disturbance (logging, fire, etc.), but the area has the potential to become (grow into) habitat #1 or #2 as described above if given enough time and appropriate management. No attempt was made to estimate the time until the stands would reach a habitat type 1 or type 2 condition. Some residual stands in this category might require only a few decades. Others stands, such as recovering clearcuts, might take a century or more.

Type 4: No Potential: (meets no known spotted owl needs currently). Canopy closure less than 40 percent. Natural limitations of the site will not allow the area to develop into habitat type #1 or #2 as described above. Examples include: chaparral, natural meadows, rocky scablands, and oak woodlands.

Type 5: Dispersal with potential: (currently provides structure believed to be important for spotted owl dispersal). Canopy closure greater than 40 percent. Disturbance (fire, logging, etc.) has created this condition, but the area has the potential to become (grow into) habitat #1 or #2 as described above if given sufficient time and appropriate management.

Type 6: Dispersal with no potential: (currently provides structure believed to be important for spotted owl dispersal. Canopy closure greater than 40 percent. Natural conditions limit the canopy closure and forest development potential (tree size and stocking) to the point that the stand will most likely never reach habitat conditions consistent with habitat #1 or #2 as described above.

Currently there are 13,588 acres of habitat suitable for spotted owl nesting, roosting, or foraging (Type 1 + Type 2) on BLM-administered lands within the proposed CSEEA. This represents approximately 26 percent of the CSEEA analysis area federal land base. Another 12,605 acres (24 percent) has the potential to become suitable habitat at some point in the future. The proposed CSEEA landscape will never even approach the appearance of a contiguous block of late-successional habitat regardless of the future management alternative selected.

Private Lands

It is assumed that private lands intermingled with the proposed CSEEA will not provide substantial amounts of suitable spotted owl habitat over time. Current and past land management practices employed on private lands in the area supports this assumption.

Spotted Owl Designated Critical Habitat

There are 27,782 acres of spotted owl Critical Habitat Unit (CHU) #OR-38 in the CSEEA analysis area. The USFWS designated CHUs on federal lands throughout the range of the northern spotted owl after the species was listed as threatened. The purpose of the CHUs was to provide essential nesting, roosting, foraging, and dispersal habitat for the species to ensure its long term viability. The specific purpose of CHU OR-38 was to provide linkage between the Western Cascades and Klamath Provinces through the I-5 Area of Concern. The Jenny Creek LSR lies on the eastern flank of the I-5 Area of Concern. The habitat breakdown for the lands in common between the CSEEA analysis area and CHU OR-38 is described in table 2-17 above.

Spotted Owl Reproduction

Several attempts were made to develop conservation plans for the spotted owl and other late-successional associated species prior to the development of the Northwest

Forest Plan. These plans attempted to provide a conservation strategy that would ensure the viability of the spotted owl. Common to all of these plans was a system of reserves along the Cascades. Although different plans had different reserve boundaries, they all showed a reserve in the general area of the proposed CSEEA. At one point, there was a stated conservation goal of 17 to 20 reproducing pairs of spotted owls in the area that is now the Jenny Creek LSR. As previously mentioned the Jenny Creek LSR has 17 known spotted owl pair sites as defined by the Interagency Spotted Owl Protocol with an additional 4 sites in the CSEEA analysis area outside the LSR. The Jenny Creek LSR is not functioning at the desired spotted owl population support level. See the spotted owl section in the *Jenny Creek Late-Successional Reserve Assessment* for more details about spotted owls in the LSR and vicinity.

Not all of the sites in the LSR or the CSEEA analysis area contribute to recruitment into the northern spotted owl population on a regular basis. There are only four ways to increase spotted owl productivity of the proposed CSEEA :

1) Increase the quality of existing suitable habitat.
2) Increase the amount of suitable habitat.
3) Rearrange the same amount of suitable habitat on the landscape so that it becomes more useful to the owls.
4) Expand the LSR to include more suitable habitat and active spotted owl sites if possible.

Of these possible strategies, probably only 2 and 4 are feasible, because there is not the expertise or time for numbers 1 and 3. Strategy number 4 was not considered or explored in the *Jenny Creek Late-Successional Reserve Assessment* but is being addressed in this document.

Potential for Spotted Owl Dispersal

Banding records make it clear that the spotted owls in the LSR and CSEEA analysis area are not currently isolated from spotted owls in the Matrix. It is also clear that there is genetic exchange with populations to the north, east and west. There is no documented spotted owl movement in either direction across the I-5 corridor within the CSEEA or to and from the LSRs to the west. Although in one notable case, a bird banded as a fledgling near Ruch, Oregon was recaptured some years later in the Jenny Creek LSR as a breeding adult. This bird moved 35 miles into the LSR. The route this individual took is unknown. See the spotted owl section of the *Jenny Creek Late-Successional Reserve Assessment* for more detailed information on spotted owl movements into, out of, and within the Jenny Creek LSR. Table 2-18 below indicates the distance between the Jenny Creek LSR and the closest neighboring LSRs.

Table 2-18. Distance and Direction to nearest LSRs from Jenny Creek LSR

Direction	Center to Center Distance (miles)	Edge to Edge Distance (miles)	Majority Ownership of Intervening Lands
N	18	5	Federal Matrix and Private Industrial Timberlands
SE	21	6	Private, Unknown Type/Use
W	12	5	Federal Withdrawn/Reserved and Private mixed Type/ Use
E	None	None	NA.

Golden Eagle (*Aquila chrysaetos*)

While the golden eagle is not listed under the ESA and is not a Bureau Sensitive species, it is protected under the Bald and Golden Eagle Protection Act of 1940. There are no known nests in the proposed CSEEA. There have been numerous sightings in the Jenny Creek and Emigrant Creek drainages, and it is likely that there are undiscovered nests in the timbered patches in the southern portions of the analysis area. This species is associated with late-successional habitat in this area; it builds large nests in dominant overstory trees. The nest trees often have significant defect, such as a blown out top or large branches, and are usually one of the largest diameter trees in mature and old-growth stands. Known nest sites are located outside of the proposed CSEEA by several miles.

Northern Goshawk (*Accipiter gentilis*)

The northern goshawk is a Bureau-sensitive species. In our area, this species appears to be a foraging habitat generalist and a nesting habitat specialist. Preferred nesting habitat for northern goshawks in this part of their range is late-successional Mixed Conifer and White Fir Forest zones. Nests are built in crotches of forked trees, at the base of large limbs, or at the "barber chair" of a blown out top that has been replaced by an upward curving side branch that has assumed apical dominance. Nest trees are usually among the largest diameter trees in the stand. There are three known nest sites within the CSEEA analysis area. There has not been any systematic inventory for goshawks within the proposed CSEEA. However, numerous incidental sightings documented over the years make it likely that there are as yet undiscovered nests in the LSR.

Great Gray Owl (*Strix nebulosa*)

The great gray owl is a Bureau-sensitive species that also receives protection buffers under the FSEIS ROD. Great gray owls in our area nest in mature/late seral Mixed Conifer and White Fir Forests, and forage primarily in the meadows/grassland or early seral stand conditions of conifer forests. There is one known great gray owl nest site in the CSEEA analysis area. Since 1992, there have been some opportunistic inventories for great gray owls, but no widespread systematic CSEEA inventory. However, incidental sightings have been reported over the years. It is highly likely that there are as yet undiscovered nests in the CSEEA analysis area. The mix of mature timber stands and grassy open areas in the southern portions of the analysis area looks especially suitable. Population trend in the CSEEA analysis area is unknown, but based on the number of reported sightings and the results of surveys in adjacent matrix lands to the north, the population in the southern Cascades appears to be stable.

White-headed Woodpecker (*Dendrocopos albolarvatus*)

The white-headed woodpecker is a Bureau assessment species. The FSEIS ROD directs that this species be given extra protection where it occurs by retaining more snags in harvest units. In our area, primary habitat is found in the White Fir and Mixed Conifer Forests where pines are a component of the conifer stands. This species nests in cavities it creates in relatively large pine snags. Little is known about this species within the CSEEA analysis area. However, field observations indicate that the population is probably quite small. There are only occasional reported sightings of white-headed woodpeckers in the northern portion of the CSEEA analysis area.

Black-backed Woodpecker (*Picoides arcticus*)

The black-backed woodpecker is a Bureau assessment species. It is also a species that is to receive extra protection under the FSEIS ROD by retention of additional snags in harvest units. Little is known about this species in the CSEEA analysis area. In our area, primary habitat is found in the white fir communities.

Northern Three-toed Woodpecker (*Picoides tridactylus*)

The northern three-toed woodpecker is a Bureau assessment species. Little is known about this species in the CSEEA analysis area. Primary habitat is found in the White Fir Forests.

Pileated Woodpecker (*Dryocopus pileatus*)

The pileated woodpecker is a Bureau assessment species that is found throughout the CSEEA. Primary habitat is mature/old-growth Mixed Conifer and White Fir coniferous forests. It is also found in lower elevation woodlands in fewer numbers than in the other zones, but only if conifers or hardwoods are large enough to create nest and roost cavities. Nothing is known about actual population trend for this species in the CSEEA. Populations have likely declined due to harvesting of the mature/old-growth coniferous forest previous to designation of the LSR and proposed CSEEA in 1995.

Flammulated Owl (*Otus flammeolus*)

The flammulated owl is a Bureau assessment species that is found throughout the proposed CSEEA. FSEIS ROD designates that this species is to receive extra protection by retention of additional snags in harvest units. Primary habitat is conifer forest intermixed with oak-woodland and grassland in mixed conifer communities. Population trend in the proposed CSEEA is unknown. This species has been most often detected during spotted owl inventories. Flammulated owls nests in cavities created by other birds species (pileated woodpecker) in large pine trees and snags.

Pygmy Nuthatch (*Sitta pymaea*)

The pygmy nuthatch was identified in the FSEIS ROD as a species to receive protection buffers where nest/roost sites are found. Primary habitat is mature/old-growth conifer forest with a component of pine in the mixed conifer and white fir communities. An open canopy is preferred. Roost sites, which may shelter over 100 individuals, are very important for winter survival. Little is known about this species in the CSEEA analysis area other than its occurrence. There are no known roost sites in the proposed CSEEA. There has been no specific inventory of this species in the CSEEA analysis area.

Reptiles and Amphibians

Western Pond Turtle (*Clemmys marmorata*)

The western pond turtle is a Bureau-sensitive species. Preferred habitat is ponds or streams with abundant aquatic vegetation, basking structure (rocks and/or logs), and adjacent terrestrial habitat suitable for nesting and overwintering (Holland personal communication 1993). They are generally found below 3,600 feet in elevation. There are several known populations within the CSEEA analysis area.

Preferred nesting habitat is dry, clay soil on a southern aspect. Western pond turtles generally overwinter under the duff layer of a tree or shrub. They have been observed (in other parts of their range) to travel up to 300 meters from water to find overwintering sites. Some individuals are known to spend up to nine months at a time on dry land. Consequently, this species is somewhat dependant on upslope as well as in-stream conditions.

In other parts of the turtle's range grazing in and near the riparian zone impacts nests due to trampling. This may occur in the CSEEA analysis as well although it has not been documented. Nests are also lost to predation by racoons (native species) and opossums (introduced species). Ashland Resource area initiated an informal monitoring program for two Jenny Creek turtle populations in 1994. There is not enough data to show any trends.

Cascade Frog *(Rana cascadae)*

The Cascade frog is a Bureau assessment species. The frog prefers mountain meadows habitat characterized by marsh marigolds and small ponds or potholes with little aquatic vegetation. This species is known from at least one location in the analysis area. Extensive, but informal, surveys for aquatic amphibians conducted in 1999 in the southern portion of the analysis area resulted in negative results for this species.

Tailed Frog *(Ascaphus truei)*

The tailed frog is a Bureau assessment species that prefers fast-flowing, cold, perennial streams in mixed conifer and white fir forested habitat. There are no known records of this species in the CSEEA, but because of suitable habitat it is likely present in the analysis area. Extensive, but informal, surveys for aquatic amphibians conducted in 1999 in the southern portion of the analysis area resulted in negative results for this species.

California Mountain Kingsnake *(Lampropeltis zonata)*

The California mountain kingsnake is a Bureau assessment species. This species is known to occur in the analysis area but nothing is known about population trends. Preferred habitat is oak-woodland and mountain chaparral plant communities.

Common Kingsnake *(Lampropeltis getulus)*

The common kingsnake is a Bureau assessment species. There are no records, but this species is likely present in the analysis area. Preferred habitat is riparian vegetation along streams in the Illinois and Rogue Valley.

Mammals

Fisher *(Martes pennanti)*

The fisher is a Bureau assessment species. Preferred habitat is dense conifer forests in mixed conifer and white fir communities. There are no recent records of fisher in the CSEEA. Populations were quite high in the upper portions of the Jenny Creek watershed at the turn of the century, but intensive trapping caused a decline in the population. There is no explanation why fisher have not recovered with the decrease in trapping pressure, but it is speculated that habitat loss due to intensive timber harvest and associated road building has kept the population depressed. Track counts were conducted in portions of the LSR portion of the CSEEA analysis area in the winters of 1992-93 and 1993-94. The results were negative.

There are no specific protection measures prescribed for this species. The steps necessary to protect the species and its habitat are largely unknown, other than the retention/protection of hollow logs and trees, large tree and snag cavities, and large horizontal brooms as potential den sites.

American Marten *(Martes americana)*

The marten is a Bureau assessment species. Preferred habitat is mature/old-growth conifer forests with an abundance of large down woody material and standing snags in mixed conifer and white fir communities. Marten tracks have been found in the Jenny Creek watershed in the Howard Prairie and Johnson Creek areas. It is highly likely that marten occur in the proposed CSEEA. However, little is known about the present distribution and abundance of this species in the CSEEA analysis area. Historically, the population is believed to have been quite high, but declined because of intense trapping. As with the fisher, habitat loss due to intensive timber harvest and associated road building probably has kept populations depressed.

There are no specific protection measures prescribed for this species. It is largely unknown what steps are necessary to protect the species and its habitat other than retention/protection of potential den site, in hollow logs and trees, large tree and snag cavities, and on large horizontal brooms.

Pacific Pallid Bat (*Antrozous pallidus*)

The Pacific pallid bat is a Bureau assessment species and is a Survey and Manage strategy 1 & 2 species in the ROD. Preferred habitat is canyons and other rocky areas near water sources in arid areas. There are records of this species occurring in the CSEEA analysis area. However, little is known of its distribution and abundance.

Red Tree vole (*Arborimus longicaudus*)

This species is listed as a Survey and Manage strategy 2 species in the NWFP. No surveys have been conducted in the CSEEA analysis area. Interstate 5 is the eastern edge of the known and suspected range of this species outside the majority of the proposed CSEEA. Surveys, conducted between the Jenny Creek LSR and the eastern edge of the species range were negative results. This arboreal vole is closely associated with Douglas-fir, whose needles it consumes and uses to make nests.

Townsend's Big-eared Bat (*Plecotus townsendii*)

The Townsend's big-eared bat is a Bureau sensitive, Survey and Manage, and Protection Buffer species. Preferred habitat is caves, crevices, and abandoned mines. There are no known records of this species being present in the analysis area. The standard bat inventory technique of mist netting over water sources does not usually result in captures of this species because their superior echolocation ability allows the bats to detect and avoid the nets. The absence of this species in inventory data should not be interpreted as absence of the species in the survey area. The rimrock/cliffs of the lower Jenny Creek canyon, Pilot Rock area, and the "Cathedral Cliffs" likely provide suitable habitat. Townsend's big-eared bats have been found in the Klamath Canyon, which is nearby to the south east of the analysis area (and were reported to be present at Pilot Rock according to the nomination document). See Pilot Rock ACEC section for further discussion.

Fringed Myotis (*Myotis thysanodes*)

The fringed myotis is a Bureau assessment bat species and is a Survey and Manage strategy 1 & 2 species in the ROD. It appears to be a habitat generalist since it is found in both forested and non-forested habitats. Caves, crevices, abandoned buildings, or other similar structures are required for nursery colonies. There are records of this species occurring in the analysis area, but little is known of its distribution and abundance.

Terrestrial Mollusks

There are six species of terrestrial mollusks (slugs and land snails) with special status that are known or suspected to occur in the CSEEA analysis area (Table 2-19). These species are listed under Survey and Manage strategy 1 and 2 in the NWFP. There have been limited surveys by researchers in the CSEEA analysis area. There are only general suggestions regarding protection measures for these species at this time. Down wood and vegetative cover are important habitat attributes for these species.

Special Emphasis Species

Black-tailed deer (*Odocoileus hemionus*) and Roosevelt elk (*Cervus elaphus*) are considered special emphasis species in the CSEEA analysis. These species are not old-growth/late-successional habitat associated; they are dependant on early successional stages for forage. They have been given special attention in the assessment because of their recreational value for both hunting and viewing. The 1995 RMP designated big game management areas (see map 21). Two of these, Jenny Creek Elk Management Area and

Table 2-19. Special Status Terrestrial Mollusks known or suspected in the CSEEA

Species	Status	Presence
Helminthoglypta hertleini (land snail)	S&M 1 and 2	Suspected
Megomphix hemphilli (land snail)	S&M 1 and 2	Suspected
Monadenia Chaceana (land snail)	S&M 1 and 2	Probable
Trilobopsis tehemana (land snail)	S&M 1 and 2	Suspected
Prophysian dubium (slug)	S&M 1 and 2	Suspected
Prophysian coerulcum (slug)	S&M 1 and 2	Yes

State line Deer Winter Range Area, fall entirely within the CSEEA analysis area. The Emigrant Creek Deer Winter Range area is partially within the CSEEA analysis area. The Jenny Creek Elk Management area is 9,900 acres. The combined acreage of the two deer winter range areas within the CSEEA analysis area is 7,650 acres.

Black-tailed Deer *(Odocoileus hemionus)*

Black-tailed deer are quite numerous throughout the CSEEA analysis area. Both a residential population and a migratory population use this area. The resident population appears to make a short distance altitudinal migration, mostly within the CSEEA analysis area. The migratory population includes individuals that summer as far away as Fort Klamath, Oregon.

The CSEEA analysis area includes Agate Flat which ODFW considers to be the most important deer winter range in southwestern Oregon. Deer trend counts conducted by Oregon Department of Fish and Wildlife (ODFW) indicate a relatively stable population. Historically, there have been some decreases in the population due to die-offs during extreme winter weather, but the population has recovered. In recent years, surveys have revealed lower than desired buck/doe ratios. This finding indicates heavy hunting pressure in the areas used by the deer in the fall and/or poor escapement of legal bucks. High road density and large expanses of land without adequate hiding cover on the summer/fall range are suspected of contributing to poor buck survival through the hunting season.

Most of the deer using the CSEEA analysis area generally winter in the lower elevation woodlands and summer in the Mixed Conifer and White Fir Forests and openings at higher elevations. Habitat condition on both the winter and summer range is fair.

Summer range forage condition appears to be adequate currently, but there is concern that managing the Jenny Creek LSR for late-successional conditions will limit forage availability on public lands. ODFW is concerned about decreases in summer thermal cover due to intensive timber harvest (both recent and historic) on both private and public lands in the area .

Forage condition on deer winter range is deteriorating due to the encroachment of exotic grasses and forbs, fire exclusion from the mountain chaparral vegetative community, and overgrazing, particularly on private land. Yellow starthistle, medusahead, and cheatgrass are some of the more common introduced species that are displacing native grasses and forbs. Compared to native species, these exotics produce poor deer forage. Fire exclusion has allowed wedgeleaf ceaonothus (the browse species favored by wintering deer) to become decadent and of little forage value.

Under natural conditions, fire regenerates wedgeleaf ceaonothus. Due to intensive, largely successful fire suppression efforts, wedgeleaf has declined. Existing plants are old and decadent and forage quality and quantity have decreased dramatically. The objective of several controlled burns in the winter range area in Oregon was to regenerate wedgeleaf ceanothus. These burns were small, occurred over 10 years ago and were only marginally successful.

Livestock grazing has a potential two-fold effect on forage conditions: First, livestock consume forage that would otherwise be available for deer; and second, overgrazing reduces the vigor of native species so that they are eventually displaced by exotic species.

In the fall and spring, deer in this area move to sprouting grass as a primary dietary component, taking advantage of the spring and fall "green up". The green up intensity at any given spot is dependent on several factors including amount of moisture and amount of sun available to the growing grass.

Deer in this area use the timbered stringers which are intermixed with the brush fields, open areas, and oak woodlands for thermal cover. Winter thermal cover generally has the following attributes:

- conifer stands composed of trees greater than approximately 30 feet in height
- canopy closure 70 percent or greater
- the stands are greater than 0.50 acre

Thermal cover present on the winter range in the CSEEA analysis area is limited due to the open condition of vegetation at lower elevations. What limited cover there is aids deer in energy conservation by retarding heat loss and can make the difference in survival in extreme weather. Thermal cover condition on winter range has been degraded primarily by timber harvest.

Vehicular disturbance has been identified as a major contributing factor causing stress to deer on the winter range. When deer are disturbed, their metabolic rate increases and energy reserves are depleted unnecessarily. Open road density greater than 1.5 miles per square mile is generally accepted as a threshold beyond which vehicular disturbance has the potential to become a major factor in energy loss. Currently, open road density on deer winter range in the CSEEA analysis area is approximately 2.5 miles per square mile.

Roosevelt Elk *(Cervus elaphus)*

Roosevelt elk are present throughout the CSEEA analysis area in varying numbers. There are substantial herds found in the Chinquapin Mountain and Keene Creek Ridge areas and a small herd in the Cottonwood Creek drainage west of I-5. The rest of the elk in the proposed CSEEA tend to congregate in smaller scattered herds. Radio telemetry indicates that there is very little, if any, interchange of individuals from the herds separated by the freeway. ODFW trend counts for the Rogue Big Game Management Unit indicate an increasing population of elk. The counts are not specific to the CSEEA analysis area, but the population trend in the proposed CSEEA should not differ much from the management unit as a whole. Habitat condition for elk is judged to be good as reflected in the increasing populations. ODFW is concerned about potential competition between elk and deer for the somewhat limited available forage because of the increasing elk population on shared winter range.

The elk management area in the Jenny Creek watershed was established to emphasize elk management in the watershed's valley floor. The Jenny Creek Elk Management area encompasses 15,300 acres of the Jenny Creek watershed and overlays deer winter range as well. Part of the Jenny Creek LSR overlays the elk management area. A combination of improved habitat conditions, especially forage conditions, and a regulated elk population would minimize the competition between elk and wintering deer.

Transportation System

Travel routes in the CSEEA are used by cars, trucks, heavy equipment, motorcycles, bicycles, horses, pedestrians, and other modes of transportation. These routes are used for recreation, resource management, and private property access. The BLM provides a transportation system for many different recreation experiences and management opportunities (map 22).

The BLM identifies approximately 450 miles of road on approximately 91,640 acres of land across all ownerships within the proposed CSEEA. Of this total, the BLM controls approximately 295 miles of road that accesses approximately 56,929 acres of BLM land. Roads in the CSEEA vary from primitive four wheel drive roads to paved highways. BLM inventories contain very little information about non-BLM controlled roads. Most of the County and State roads have a bituminous surface and private roads are usually rocked or are left unsurfaced.

The lands within the CSEEA are owned by private individuals, the BLM, and large companies. Roads in the CSEEA are controlled or owned by the BLM, timber companies, Jackson County, the State of Oregon, and many private landowners. Several county roads, State Highway 66, old State Highway 99, and Interstate 5 are major highways that provide access into and across the proposed CSEEA. Major access roads that the BLM uses to access the CSEEA are Pilot Rock, Schoheim, Copco, Emigrant Creek, Baldy Creek, and Soda Mountain roads. Many shorter private and BLM roads provide access within the CSEEA. In many areas the public has no legal right to use roads to access public lands (refer to TMOs Appendix H, map 23). In several areas the BLM has obtained legal access for the management of public lands. In some areas the BLM and large land owners have reciprocal agreements that allow access for forest management of lands and removal of timber. On other roads the BLM has obtained easements of which some roads allow public access while other roads do not. At this time some landowners have not prevented the public from general use of their road (ie. Copco road, and portions of Emigrant Creek, Baldy Creek, and Soda Mountain roads). However, this informal public use could cease at any time.

BLM controlled roads are generally open for vehicle use by the public unless blocked by gates or other road barriers (see map 24). Gates and road barriers regulate vehicle access to reduce maintenance costs, road damage, soil erosion, transfer of noxious weeds, and wildlife disturbance.

Road maintenance is conducted by the different owners and management agencies. Water, oil, or lignin are usually applied to road surfaces when hauling during dry periods for dust abatement and to keep roads from disintegrating. Water is used when placing surface rock and for road maintenance, which allows for proper processing and reduced segregation of the road surface rock. There are developed water sources in the watershed where the BLM may obtain water.

Most BLM controlled roads were constructed and are maintained for log hauling and for administrative purposes. The BLM charges fees for commercial use of roads and then uses these fees to help pay for road maintenance. Many roads previously maintained at a high level are not being maintained to that extent any longer due to reduced timber harvesting. To reduce maintenance requirements and erosion potential, some unnecessary roads have been, or will be, decommissioned. However, roads that are used to access private lands may not be permanently closed or decommissioned. Other roads are closed until future access is needed and many others are maintained at the lowest possible levels with an emphasis on proper drainage. BLM roads have a maintenance level assigned to them (see map 25). Roads are monitored and the maintenance levels are modified when needs and conditions change. Maintenance levels range from minimal standards on short roads to high standards on main roads. Roads are like any other facility or structure, they need to be maintained to function as designed. Roads that have been maintained and are in good condition are shown on map 26. Sharing and maintaining roads with landowners has reduced total miles of BLM road necessary for access and also reduced maintenance costs. The goal is to maintain the entire transportation system in a safe and environmentally sound condition. The result is a transportation system that provides for various recreational activities, private access, logging, fire fighting access, and other land management uses.

Road maintenance includes removing safety hazards, reducing soil erosion potential and providing for fish passage at all potential fish-bearing stream crossings. Safety hazards include hazard trees that have the potential to fall on houses, recreation areas, or roadways. Hazard trees are usually dead, but may be alive with roots undercut or with significant physical damage to the trunk or root system. Proper maintenance of road drainage systems and stream crossing culverts is essential to avoid both erosion and fish passage problems. Most of the existing culverts were designed to withstand 50-year flood events. New drainage structures will be designed to withstand a 100-year flood event and if appropriate, provide for fish passage. Road protection measures include constructing drainage structures, grass seeding, blocking roads, placing road surface rock, and applying bituminous surfacing.

The BLM improved the drainage of the western 12 miles of the Schoheim road (BLM road 41-2E-10.1) as a result of the input from the local environmental community (Salix Applied Earthcare, 1998). The eastern portion of the Schoheim road and its spurs are in poor condition due to lack of maintenance (see map 26). The lack of maintenance on the eastern portion of the Schoheim road is a result of input from the environmental community to decommission the road.

Three road surface types are found on BLM roads: bituminous (asphalt), rocked, and natural (no surface protection). Main access roads usually have a bituminous surface, but may have a crushed rock surface. Roads off main access roads usually have a crushed rock surface, and dead end spurs generally have a natural surface (see map 27). Most rocked roads in the proposed CSEEA are located in the northern portion. The southern portion has more natural surfaced roads which include jeep roads. Adequately surfaced roads generally allow for year-round travel and reduce soil erosion, which helps to minimize stream sedimentation. Several unsurfaced roads are closed to minimize damage and erosion. There are developed quarries on private and federal land in the watershed where rock may be obtained for surfacing roads, drainage protection, and maintenance.

Road planning, location, design, construction, use, and maintenance are conducted with the goal of meeting transportation objectives while protecting resources. Best Management Practices from the Medford District Resource Management Plan (USDI, 1995a, pages 149-177) provide guidance.

Livestock Grazing

The history of livestock grazing in the area of the Cascade Siskiyou Ecological Emphasis Area dates back to the 1850s. Large herds of horses and cattle grazed the area from the Klamath River to the Dead Indian Plateau. With the expansion of farming and ranching in the 1850s, ranchers began to move livestock from the Rogue Valley to the lands east of the Cascades. During the mid-1860s ranchers began to exploit the rich meadows of the high elevation meadows. Prior to 1870, Rogue Valley ranchers were unable to supply all of the meat needed to meet the demands by gold miners. Sheep operators ran large bands of sheep in the area. Sheep were pastured with cattle in the high mountain meadows of the Cascades. Severe overgrazing was reported in some areas of the upper Rogue Valley. Woolen mills established in Ashland were successful until the drop in wool prices during the 1930s. Raising livestock was very profitable in both the Rogue Valley and Klamath Basin in these early years.(Follansbee et. al., 1978).

During this period of unregulated use, rangeland resources and ecological conditions are reported to have suffered significant harm from overgrazing. Control of these ranges did not occur until passage of the Taylor Grazing Act in 1934. Prior to 1934, public rangelands of the west were administered by the General Land Office. This office was to provide for survey and disposition of public domain lands from federal ownership to state and private ownership. The Taylor Grazing Act was the vehicle for recognizing these public domain lands as a national asset and withdrawing them from future filing or transfer. The long term goals of this law were the improvement of range conditions and the stabilization of the western livestock industry. The Taylor Grazing act gave a preference for grazing permits to settlers, residents, and other stock owners who owned adjacent or nearby lands or water rights. Grazing allotments established on BLM lands were based upon historical areas of grazing use at the time of passage of this important land management tool.

In 1946, the Bureau of Land Management was established. During the early 1960s, range surveys were completed to determine the capacity of the land for grazing. Following these surveys, decisions on forage were adjudicated and livestock numbers set on most areas in the west. In April of 1975, a Federal court agreement required the BLM to prepare Grazing Environmental Statements on public grazing lands. To comply with this agreement, the *Medford District Grazing Management Program Environmental Impact Statement* was completed in 1984. Additional planning documents have been completed since that time in the form of the *Final Supplemental EIS on Management of Habitat for Late-Successional and Old growth Forest Related Species Within the Range of the Northern Spotted Owl*(1994); *the Medford District Resource Management Plan EIS* (1994); *and the Jenny Creek Watershed Assessment and Analysis* (USDI 1995b). The Oregon/ Washington Office of the BLM has adopted Standards and Guidelines for Rangeland Health that are to be applied to rangeland management decisions (USDI 1997). These Standards and Guidelines were adopted to carry out new Fundamentals of Rangeland Health developed by the Secretary of the Interior (Appendix I).

Early grazing was largely uncoordinated and conflicts occurred between California livestock operations moving cattle onto summer ranges and the operators who lived in Oregon. In 1974, a Coordinated Resource Management Plan was written which attempted to reduce conflicts between California and Oregon operators and to improve rangeland conditions on the Soda Mountain Allotment. A separate Allotment Management Plan was developed to improve rangeland conditions and riparian habitat within the Jenny Creek Allotment in 1997. The Allotment Management Plan includes terms and conditions to achieve specific resource condition objectives.

It is significant to note that cattle numbers on the Soda Mountain and Keene Creek allotments have been reduced dramatically since the 1970s. Cattle numbers are presently 34 percent and 39 percent, respectively, of the numbers grazed in the 1970s. Reductions on the Soda Mountain allotment have taken place for a variety of reasons. Timber companies have reduced cattle leases due to environmental concerns, conflicts, and low revenues which failed to cover administrative costs. In some cases, leases were lost due to retirements, failures to comply with regulations and conflicts with rural interface areas. In 1994, the Keene Creek allotment was reduced through a voluntary agreement with the livestock operator. Reorganization of the ranch and rebuilding of herd numbers, increasing conflicts with recreationists at Howard and Hyatt Lakes, summer homes, recognition of increasing numbers of deer and elk, and the presence of candidate fish species such as the Jenny Creek sucker and Red-band trout contributed to this agreement.

Livestock grazing is a grand-fathered use and occurs within the Soda Mountain Wilderness Study Area. Rangeland management activities in the Soda Mountain WSA are administered under guidelines contained in the *Interim Management Policy for Lands Under Wilderness Review*(H-8550-1). This policy outlines minimum data requirements and maximum acceptable impacts for rangeland developments and livestock grazing.

The CSEEA study area contains all or part of eight separate grazing allotments. Table 2-20 summarizes current allotments, operators, and livestock use associated with the study area. Map 28 shows allotment locations and rangeland improvements across the CSEEA. Currently, eight operators have active authorized use within the area. The authorized use on public lands for the 1999 grazing year was 4,352 AUMs on the total area of the allotments, of which 413 AUMs were on vacant allotments. Accurate AUM estimates on the CSEEA are not possible in many cases because the allotments extend beyond the CSEEA study area. The only allotments totally within the CSEEA are Box-R, Jenny Creek, and Agate.

Ashland Resource Area (Medford District)					
Agate	97	Vacant	----------	----------	9
Box R Ranch Jenny Creek	80 1,303	Don Rowlett Taylor Ranch	1 30	6/15-11/15 5/16-9/10	5 116
Keene Creek	10,240	Joe Dauenhauer	350	6/16-10/15	1,404
Keene Creek		Jim Miller	59	6/16-9/30	208
Siskiyou	1,930	Vacant	----------	----------	200
Soda Mountain	35,471	Courtney Ranch	181	5/1-10/15	1,000
Soda Mountain		Bob Miller	47	5/16-10/15	238
			58	6/16-10/15	232
Soda Mountain		Jennifer Walt	80	6/16-10/15	321
Klamath Resource Area (Lakeview District)					
Dixie	100	Jerry Barzy	75	5/15-9/15	415
Buck Mountain	520	Vacant	56	----------	204

*indicates approximate public land acres in the proposed CSEEA analysis area

Management objectives for individual allotments are dynamic and change over time as new information is discovered. This helps to determine the level of intensity with which allotments are managed in terms of planning, monitoring, and investments in rangeland improvement projects. In order to describe the level of management required, each allotment has been placed in one of three categories. This process is referred to as Allotment Categorization and is comprised of :

- Improve (I) – the allotment will be managed intensively for improvements
- Maintain (M) – current management will be sufficient to maintain conditions
- Custodial (C) – a minimum amount of labor will be expended to maintain existing resources

The categorization of allotments into these categories is not dependent solely on a rangeland condition rating, but also reflects such factors as potential conflicts between resource uses and potential productivity on the allotment. All of the allotments within the proposed CSEEA are categorized as Improve allotments based upon resources with the exception of the Agate allotment which is a Custodial allotment.

Part of the livestock management program includes monitoring of the rangeland resources in order to determine progress towards meeting identified objectives. This involves the orderly collection, analysis, and interpretation of resource data from permanently established plots within the allotments (Appendix J). Trend is the direction of change in ecological status, or some other resource value rating, observed over time. This is usually described as being upward (higher rating), downward (lower rating), or static (no apparent trend). Other ongoing studies include photo points, utilization and utilization mapping and actual use reports. The level of permitted grazing use in the proposed CSEEA has been dramatically reduced over time. In addition, the season of use, or amount of time cattle are within the area has also been reduced over time. These factors, in combination with improved handling of livestock, maintenance of rangeland improvements to distribute livestock, and implementation of rotations have resulted in improved conditions on the rangeland. The uplands are currently in good condition, from a livestock grazing perspective, with a static to slightly upward trend, based on ten years of data collection. Some riparian areas have shown a significant upward trend as a result of improved management on the allotments(see photos below).

Installation, use, maintenance and/or modification of rangeland improvements are often authorized through Cooperative Agreements. Rangeland improvements are constructed to achieve livestock management objectives or to improve habitat conditions. The two types of rangeland improvements are non-structural and structural. Non-structural rangeland improvements include grass and forbs seeding and prescribed burning. Structural rangeland improvements include fences, corrals, cattle guards and water developments such as pipelines, spring developments, and reservoirs. Title to structural or removable improvements on public lands must be shared by the United States and the cooperators in proportion to the actual amount of the respective contribution to initial construction. A cooperative agreement conveys no right, title, or interest in any lands, or resources held by the United States. Maintenance of improvements, designed to benefit the livestock operation, is generally the responsibility of the livestock operator. Improvement responsibilities are also transferred with the grazing lease.

It should also be noted that partnerships have been formed with diverse groups to complete the longest known continuous Riparian Volunteer Project on an annual basis within this project area. The Jenny Creek Volunteer Riparian projects have completed extensive improvements to improve habitats within the riparian systems of the Jenny Creek area. These improvements have included fencing maintenance, off-stream water

Figure 1. Jenny Creek Allotment (South Pasture): October 1990, Prior to implementing grazing plan. Note island and center tree as reference point.

Figure 2. Jenny Creek Allotment (South Pasture): September 1998. Following implementation of grazing plan. Looking downstream on Jenny Creek.

development, riparian protection, stream bank armoring, bird box placement and a host of other habitat improvements. These projects, in conjunction with rangeland management changes, have dramatically improved the riparian systems in the study area.

Wild Horses

The Pokegama Herd Management Area was established in the 1970s with the passage of the Wild Horse and Burro Act and the first management plan for the area was written in 1978. The herd is believed to have been established in the early 1900s by a rancher who originally turned out a quarter horse stud and seven mares. Herd census indicates a relatively stable population with only gradual increases in horse numbers. The BLM Klamath Falls Field Office has primary responsibility for management of this wild horse herd and has established a management level of between 30 and 50 horses for the area (Klamath Falls Resource Management Plan,1995).

Approximately 20 acres of the 80,900 acre Pokegama Herd Management Area are within the CSEEA analysis area. This area lies along Copco road and East of the Box-O Ranch. Due to the insignificant area of overlap, the impacts to the Pokegama Herd Management Area will not be analyzed in this plan.

Recreation

The major recreation activities occurring on BLM administered lands in the proposed CSEEA planning area include camping, hiking, horseback riding, mountain biking, driving for pleasure, sightseeing, hunting, fishing, driving off highway vehicles, snow play, cross country skiing, snowmobiling, rock climbing, nature study, and vegetative gathering (mushrooms, Christmas trees, firewood). There are no developed recreation sites within the proposed CSEEA as designated in the RMP but the Hyatt Lake complex is within the expanded area proposal.

The Hyatt Lake complex consists of the main Hyatt Lake campground, Wildcat Campground, the Watchable Wildlife Site, and the Table Mountain Tubing Hill. The majority of use however is unstructured or dispersed recreation with most use occurring on roads, streams, Pilot Rock, or the Pacific Crest National Scenic Trail (PCNST).

There are two nationally designated areas within the planning area, the PCNST and the Soda Mountain Wilderness Study Area (WSA). The PCNST receives moderate use from local residents for day hikes and approximately 50-100 people pass through the area on the trail as through hikers (traveling from Mexico to Canada).

Driving for pleasure is the number one recreational activity in the United States and OHV use is extremely popular in the Agate Flat area with this area proposed as part of the Oregon Backcountry Discovery Route by the Oregon State Parks Department. This program is a cooperative effort between the Oregon State Parks, the U.S. Forest Service and the BLM. The purpose of the program is to provide a backcountry route for vehicles, using existing roads, to connect California, Oregon, and Washington. The route through California has been designated up to the Oregon border at Copco Lake and it has been designated in Oregon down to Highway 66 at the Greensprings summit. The Schoheim road is another popular travel route for motorized vehicles providing spectacular views of northern California including Iron Gate Reservoir and Mt. Shasta. This road is also heavily used by hunters during deer hunting season.

The Pilot Rock area is another popular recreation destination, with people accessing the PCNST from there for day hikes, people climbing the rock, and for collecting fossils and wildflower observation.

Since the majority of the area is undeveloped, there are no accurate use figures but use is moderate to light throughout the proposed CSEEA. The Hyatt Lake complex receives heavy use throughout the year.

Minerals

The Medford Resource Management Plan identifies the CSEEA as having low potential for locatable minerals, moderate potential for oil and gas and low potential for geothermal resources, depending on the location in the proposed CSEEA.

A mineral resources study of the Soda Mountain Wilderness Study Area conducted by the U.S. Geological Survey concluded much of the northern portion of the WSA has a moderate potential for gold and silver (Pickthorn and others, 1990). Based on this study, there is speculation that the area north of the WSA to the top of Soda Mountain has low to moderate potential for gold and silver but development of the area is not anticipated. This study also indicated a low potential for oil and gas and geothermal resources. In the past mining claims have been located in the Agate Flat area, primarily for agates by the local gem and mineral club. These have since been abandoned.

Authorized Uses

Background

Over time the BLM has formally recognized and authorized a variety of uses within the boundary of the proposed CSEEA. The considerable range of uses within this area on BLM land, includes an airstrip and a public school facility. The oldest of these uses is the fire lookout located atop Soda Mountain. This lookout was established in 1933 by the Oregon Department of Forestry (ODF) and is still in active status. ODF regards Soda Mountain as the most important lookout in their jurisdictional area due to its strategic position serving a two state\three county area.

Existing Authorizations

Existing authorizations within the proposed CSEEA fall broadly into two main types: linear and site authorizations. Examples of linear authorizations are roads, utility lines, and water developments such as ditches or canals. Site authorizations are all tied to the communication site which has gradually developed on Soda Mountain since the days of the first fire lookout more than sixty years ago (see photos Appendix K). Other site authorizations are linked to the microwave communication site located on "Chestnut Mountain" just southwest of Chinkapin Mountain or are facilities such as the Pinehurst School or the State Highway Department Maintenance site. Appendix L provides information on the various authorized uses occurring in the CSEEA.

The various authorizations serve a wide range of commercial and non-commercial uses and interests. Some authorizations are held by individuals for personal legal access to private property. Some are held by large corporations such as PacifiCorp, U.S. West Cellular, and COBI, which serve major markets in Oregon and California. Other authorizations are held by non-profit entities or governmental agencies which serve diverse interests along the I-5 corridor, the Green Springs Highway (State Hwy 66) and the greater three county area in southern Oregon and northern California. The authorizations range in size from a fraction of an acre to major utility lines which span long distances across public and private lands. The commercial interests involved in the various authorizations represent significant outlays of capital investment and benefit a wide range of end users who utilize water, electricity and communication services. All commercial site users pay an annual rental which is based on a national "Schedule" for determining communication site values. The importance of these services to agriculture, commerce and the public sector in this region cannot be overstated.

Rights to Sub-lease

Several communication site authorizations include the right for the Holder to sub-lease to other compatible users. Under this arrangement, additional users operate equipment for their own particular needs. This group includes a private towing company, a Jackson County consortium of users, a Federal Agency, and additional commercial operations. When added altogether, the Soda Mtn. communication site complex comprises one of the most significant sites that BLM administers in the Pacific Northwest. All commercial users pay annual site rental which is based on a national "Schedule" for determining communication site values.

Other Rights

Holders of existing authorizations have the right to "operate, maintain, and terminate" their use, system, or facility. In many cases, this right includes use of service roads which provide physical access to the use, system, or facility. In the case of the major electrical transmission lines, this right of access includes the use of minimum standard road(s) for periodic inspection and maintenance. PacifiCorp has an ongoing maintenance program whereby their facilities are monitored and maintained either on a scheduled basis or on an as needed basis when emergency conditions dictate. (See "Transportation Section" for further discussion of these roads).

Social and Economics

Introduction: Defining the Affected Area

The social and economic assessment and effects analysis was done through contact with community residents, discussions with organization and group representatives with responsibility or interest in the CSEEA area, and analysis of existing information. Kevin Preister and Luis Ibanez, of Social Ecology Associates, talked with over 41 community residents, store owners, ranchers, and recreationists, and about 46 representatives of environmental organizations, timberland owners, industry support groups, and representatives of federal land management agencies. Citizens most directly affected by CSEEA decisions are:

- Residents that live in the immediate vicinity;
- Individuals that make a living from public land resources, specifically grazing, forest resources, and recreation;
- Recreation users;
- Soda Mountain Wilderness Council, Friends of the Greensprings (FOG) and other organized interests;
- The Jackson County Board of Commissioners

From a social and economic standpoint, the Greensprings, Pinehurst and I-5 summit areas represent primary zone influenced by CSEEA of decisions. The secondary zone of influence is considered Jackson County. This section will present a rationale for this approach based on human geography and summarize major social and economic conditions for each area. Appendix M contains much of the statistical and demographic data used to support conclusions contained in this section.

Map 29 shows the boundaries of Social and Human Resource Areas in southwest Oregon and northwest California The red line shows the boundary for the Jefferson Social Resource Unit (SRU), an area with a common history, lifestyles and values. The "State of Jefferson" has long been known as an area of similarity, embodied in an effort to secede from Oregon and California that was cut short by the attack on Pearl Harbor in 1941. The story won a Pulitzer Prize in 1942 for the San Francisco Chronicle (Olson 1987). Today, there are over twenty businesses in the region sporting the name Jefferson, including the public radio station at Southern Oregon University.

Human Resource Units (HRUs) are subdivisions (shown within blue line on map 29) that reflect the boundaries within which people conduct most work, recreation, and lifestyle routines, including shopping, school affiliation, and family and social ties. These boundaries are derived from seven cultural descriptors and by self-reporting of residents. The methodology is described in Kent and Preister (1999). The seven descriptors are:

1) Publics: Segments of the population or group of people having common characteristics, interests, or some recognized demographic feature.

2) Networks: A structured arrangement of individuals who support each other in predictable ways because of their commitment to a common purpose, their shared activities, or similar attitudes.

3) Settlement Patterns: Distribution of a population in a geographic area, including historical cycles of settlement and changing land uses.

4) Work Routines: The ways in which people earn a living, including where and how. The types of employment, the skills needed, the wage levels, and the natural resources required in the process.

5) Supporting Services: Any arrangement people use for taking care of each other, including the institutions serving a community and the caretaking activities of individuals.

6) Recreational Activities: The way in which people use their leisure time.

7) Geographic Boundaries: Any unique physical feature that defines the extent of a population's routine activities.

The CSEEA area is located in the southeast part of the the Jefferson Social Resource Unit in the Rogue Valley Human Resource Unit in Oregon. It does not extend east to Klamath County or south to Siskiyou County, California. By and large the California border in this area serves as the human border as well even though there are a small number of grazing interests that cross the California/Oregon border and there are modest shopping and social ties between Yreka and Ashland. Residents in the primary influence zone of Greensprings, Pinehurst and the I-5 summit relate primarily to the Rogue Valley Human Resource Unit.

The Greensprings/Pinehurst Community

History

The Greensprings area is a 4,000-foot high plateau near where the Southern Cascades join the Siskiyou Mountains. The Greensprings extends from Keene Creek Ridge in the southwest to Parker Mountain summit in the east. Several Native American tribes used the area, among them the Klamath and the Rogue, who tended to spend most of each year in the valleys. They also liked to camp in the natural prairies at higher elevations to hunt, gather seasonal resources, to meet and trade with other groups and escape the summer heat.

In 1846, Jesse and Lindsay Applegate opened a trail that crossed the Greensprings. By the mid-1860s, people were moving in both east and west on the Applegate Trail. National events then influenced Southern Oregon and the Greensprings. The 1906 Forest Homestead Act was abused by local residents and timber companies. The settlement of many lands, including the Greensprings, was done in part by people paid by both large and small lumber companies to live on the property and make improvements until they obtained legal title to the lands. Settlers would turn over their titles to these companies. This was followed by a congressional grant of alternate sections of public land to the Oregon and California Railroad that was misused by the railroads.

Several mills were established on the Greensprings for the purpose of cutting the huge stands of old-growth sugar pine and fir. The first significant population growth came with completion of the new highway in the 1920s. Most of the residents at this time worked for mills. There was an economic downturn in the 1960s when many local mills closed their doors because they were unable to compete with the big lumber companies.

The 1970s brought a change in the Greensprings population. Unable to find suitable work, many residents moved away, changed jobs or retired. Land is said to have gone from $32 per acre in the early 1960s to $500 an acre, a price that for many out-of-state folks was a bargain. The few that moved to the Greensprings in the 1970s went there to escape the big city life and to "get back to the land."

The present Greensprings community still shares the values and traditions of those who first moved there. Residents call the Greensprings, "a strong and committed community." A major theme of community life seems to be interdependence through self-sufficiency. The caretaking aspect of this community is evident in their stories, from the old settlers to the newcomers. The value of knowing your neighbors and the commitment to respond to a call of need continue to live in these parts

The community is also very committed to education. As in the past, the Pinehurst School serves as the social hub for young and old. Currently there is interest in expanding the school district boundary to include those residents west of Tubb Springs. The average price of land is now around $2,000 per acre.

Current Conditions

Map 30 shows four general socioeconomic areas under consideration for the CSEEA. The Local residents, subdivide the Greensprings community into Areas B, C, and D. Area A, the I-5 summit, is included because of its proximity to CSEEA lands, while the Old Highway 99 area north of the Siskiyou Summit is excluded from the primary zone of influence because there is no direct access to BLM lands from this area.

The 211 units in the primary zone (Table 2-21), is based on data provided by Jackson County Information Services. If the density of 2.94 per household from the census of this area is used, about 620 people reside in this area. The Greensprings community, as defined above, is thus estimated to contain 588 people. This estimate may be high because the Greensprings Directory, developed by Friends of the Greensprings (FOG), estimates the 1996 population at 400. Between the beginning of Buckhorn Creek Road west to the Klamath County line, there are 165 mailboxes. With the same density ratio, that would mean 485 people reside on the Greensprings assuming every household has a mail box. If the difference is split, a reasonable estimate of the Greensprings population is 537. Of this estimated number, 47 are students (at Pinehurst School, Ashland public schools, and a private school).

Although some local officials have criticized the census for undercounting in Jackson County, the 1990 census provides further clues about the population. The data of Census Tract 25, Block Group 1 are shown in Table M-1 in Appendix M. It encompasses a wide area the east of Interstate 5 from the Oregon border, through the Greensprings area and Dead Indian Memorial Road country, the eastern Talent and Phoenix areas, ending at White City and Lake Creek. The 1990 census of this area was 1205.

On the basis of the 1990 census, and acknowledging that only about 45 percent (537/1205) of the people described in the Block Grant are estimated to be residents of the

Greensprings community, the following social and economic conditions pertain. The Greensprings community:

- Has more children and fewer seniors than Jackson County or the State of Oregon
- Is significantly more educated
- Has significantly greater incomes and dramatically less poverty
- Relies more on wage income, self-employment, and farm income, and less on social security
- Has a much greater proportion of owner-occupied units
- Has a much higher proportion of residents who pay more than 35% of their income for monthly homeowner costs
- Pays significantly less for rent
- Has about the same commuting time as others

Two points are worth developing. First, the numbers indicate what residents say—that they have a vibrant community with little poverty and high degrees of self-sufficiency. Second, there is some evidence of a rich/poor split. The Housing and Urban Development agency (HUD) considers a family under "cost burden" if 30 percent or more of monthly income is spent on housing. That 42 percent of homeowners spend 35 percent or more on housing indicates family budgets from stressed to simply inadequate.

Table M-2 in Appendix M shows the results of an intercensal estimate of poverty rates for school age youth, conducted by the Census Bureau in 1996. It estimated that 16.7 percent of Pinehurst students were living in poverty. This finding is not consistent with the 1990 census or with estimates of school district officials. Of the 29 students currently enrolled in the Pinehurst school, only one family had a financial hardship last winter but is now doing very well.

Table 2-21. Developed Properties in CSEEA Area

Location	1901-1950	1951-1974	1975- 1989	1990- 1999	Total
Area A I-5 Summit	2	4	3	2	11
Area B Emigrant Creek/ Greensprings Summit	12	19	39	26	96
Area C Hyatt/ Howard Prairie	3	31	21	13	68
Area D Pinehurst/Copco	11	8	10	7	36
Total					211

Source: Jackson County Information Services

- Area A is the I-5 summit, Township 40S, Range 2E, Sections 31-36; Township 41S, Range 2E, Sections 1-12.
- Area B is the Emigrant Creek drainage, including Tyler Creek and Highway 66 past the Greensprings summit to Lincoln, Township 40S, Range 2E, Sections 1-2; 11-14; 23-26; Township 41S, Range 3E, Sections 1-12; Township 40S, Range 3E, all sections.
- Area C is the Hyatt Lake/Howard Prairie area generally north of Highway 66, Township 39S, Range 3E, all sections; Township 39S, Range 4E.
- Area D is the Copco/Pinehurst area, Township 40S, Range 4E, all sections; Township 41S, Range 4E, all sections.

The Rogue Valley Council of Governments (RVCOG) engaged in extensive community contact in the Greensprings area while implementing Oregon's "Rural Unincorporated Communities" program in 1997. This effort documented pertinent social and economic conditions as well as community goals. The study reported most of the soils of the area as "severe" in relation to absorption capability of septic systems. Higher construction costs, special designs, increased maintenance, and perhaps larger drain fields to accommodate poor soils were predicted. Whether this condition would limit future development was not stated.

The RVCOG report makes clear that Greensprings residents want to maintain their rural way of life, and that they want modest development opportunities to be consistent with rural lifestyles. A preference for low densities and for small-scale and home-based businesses was expressed. The long-range goal of the community was for sustainable development which they defined as "the allowance for small amounts of growth in commercial and residential uses that sustain the needs of the community for housing and local economy while maintaining preservation of the community's rural pattern of dispersed developments in a forested environment" (RVCOG 1997: 35).

Social Institutions

A number of social institutions in the Greensprings links people within the community and with the "flatlanders" in the valley. The Pinehurst School with its active board and parent group is probably most important social institution. The school is the location for numerous community events. In addition, there are two churches, the Cascade Christian Fellowship and the Lincoln Christian Church. The Oregon Extension of Houghton College contributes to the economy and to local life by bring college students to the Greensprings each year. In addition, Health Emergency Access Response Team (HEART) was formed in 1990 to address emergency medical assistance needs.

The Friends of the Greensprings (FOG) was formed in 1986 and has served as a community forum for a variety of issues since that time. It serves to educate members about community issues and to advocate on their behalf. It has engaged in a wide range of activities from flower planting to mediating issues related to open range cattle and timber sales. It currently has about 350 members, half of whom do not live on the Greensprings.

Finally, the Soda Mountain Wilderness Council has been active for many years in promoting a wilderness designation for the Soda Mountain area. Although its interest in full preservation of the area does not have universal agreement in the community, it has gone to tremendous lengths to develop local and regional support.

The Greensprings Economy

The census revealed occupational differences between Greensprings residents and Jackson County and State of Oregon. As reported in Table M-3 (Appendix M), this area:

- Has slightly less employment in agriculture and forestry than Jackson County and the State of Oregon;
- Has higher rates of employment, nearly double in most cases, in construction, personal services, recreation services, and educational services;
- Experiences a lower proportion of its workforce engaged in durable goods manufacturing, transportation, wholesale trade, finance/real estate, and public administration, which is not surprising in a rural area;
- Like the rest of southern Oregon, relies greatly on retail trade, indicating a strong commuting lifestyle to the nearby urban centers;

Newcomers tend to be affluent. Many who lived economically on the edge during the early part of the nineties have moved away. The elderly are the only ones who are financially on the edge, according to local residents.

What we noted, in conversations with local residents, is an economy composed of:

- Commuting to employment in the Rogue Valley, which seems to dominate the local economy; those for whom commuting is not possible talk of being "locked into" a low cash condition;
- Unearned income through retired citizens;
- "Modem cowboys" making a living from the global economy in a variety of ways (a creativity consultant with international clientele, an accountant from southern California);
- An informal economy, called by "The Handyman Economy;" by which residents actively exchange services, some for cash and some for trade, by which they survive;
- A handful of former loggers/tree planters who offer their services to the community for forest management, road building or excavation; Logging history is still part of the culture and active interest was expressed in fostering higher levels of forestry work in the future;
- Numerous home occupations (RVCOG 1997);
- Fewer ties to the land. Whereas a generation ago, primary incomes were earned from the land in some way, today that is no longer the case.

Community Interests

Many people of the Greensprings are interested in the forest stewardship and management, especially in the interface. The RVCOG study reported a broad sentiment among residents that they are the real stewards of the forest resources in the area. As a corollary, they believe that corporate and government management has "pursued land management policies that do not protect or enhance the resource values of the area as effectively as the local community which is vested in the livability, responsibility to and character of the area" (RVCOG 1997: 34).

Many of these folks, as well as many of the owners whose land borders public lands, stated their concern about removing fuels and thinning to keep a forest healthy. In their opinion the BLM could do more to maintain a healthier forest at the "interface." "We worry about a fire coming onto our property," was a common statement. The summer ranger for the Oregon Department of Forestry lives in the community and is well-regarded. He has in his house a map with locations of high risk for fire. His job has been to work with residents around fire concerns and to increase awareness of and readiness for fire events.

Many residents are very concerned with the current logging of private lands going on in the Greensprings. Many have reported seeing the same levels of logging on private lands that they witnessed on public lands in the early 1970s. One resident said the difference is that "now they are logging lands that are very dry--where it takes hundreds of years to grow trees that in other areas would take only a few years. The long term effects that will have in the corridor between the Cascades and the Siskiyous will be devastating."

Data for the Greensprings are not available through Oregon Department of Forestry except estimates of intent to cut a certain volume, nor through the timber tax receipts of the State Department of Revenue. Table 2-22 contains Jackson County information that substantiates a significant trend in timber harvest toward reliance on private lands.

The cost of settlement in the Greensprings has made it impossible for average people to live there. Currently, the county has many permit fees that run in the thousands of dollars, from permitting septic tanks to buildings. Also there is a time limit attached to these permits in which work must be completed, making it difficult for those with limited resources to complete work without re-permitting. Many residents have said that it is more feasible to buy already-developed property than to start from scratch.

Concerns about open range cattle on the Greensprings have been going on for many years. FOG has taken the lead in providing a voice to these issues, conducting a survey in 1990 that documented the widespread nature of the concerns and the costs to homeowners of open range cattle. Livestock districts have been formed as one method to deal with the problem and efforts with the Oregon State Police related to traffic risk have intensified in the last year. Residents say that allotments do not have good fences. Many residents have had to repair their fences and have experienced other costs. The expected BLM investment in rangeland improvements has not materialized. "There are a couple of bad apples out there that give everyone else in the business a bad name," one person said. Others are clear about wanting to preserve the cattle culture on the Greensprings. "Cattle is not what it used to be," an oldtimer said. Other residents pointed out how cattle "keep the fuels down."

Newcomer integration remains an ongoing interest and challenge on the Greensprings. It takes about a year for newcomers in the Greensprings to feel a part of the community. During the year, it is helpful if they participate in the school functions and other social events, like the oldtimers' picnic, a yearly event where the community gathers to cut, split and stack wood for the school. Many new residents are also new to rural life and many of them do not have snow removal equipment or fire fighting capabilities such as a water truck. Longer-term residents point to the cycle of people coming in and out of the community because they do not realize what living on the Greensprings will require. "It is especially hard on the men," one woman observed, "because they don't socialize as much as women."

Summary of the Greensprings/Pinehurst Community

This is a strong, committed community. Residents expressed high value and action around education, land stewardship and production, self-sufficiency, and taking care of each other. Newcomers are wealthier, have an active interest in land stewardship, but are not thought to know much about taking care of the land. There is increasingly less livelihood tied to the land.

A Social and Economic Profile of Jackson County

Jackson County is considered the secondary zone of influence for purposes of social and economic analysis. That is because people in the Greensprings are oriented in their routines to Jackson County—work routines, family and social ties, schools, and so on. In addition, the economic costs and benefits of public land management accrue to Jackson County—timber receipts, agricultural spending, and recreation demand. The Jackson County Board of County Commissioner's representative for natural resource issues has stated the interest of Jackson County in maintaining management options for public lands in the CSEEA area, regardless of the level of timber and grazing production that ecological analysis indicates.

Appendix M contains a statistical overview of the County. RVCOG has projected expected population in Jackson County to grow by 1.7 to 2.8 percent between 2000 and 2020.

The Economic Structure of Jackson County

Table M-4 (Appendix M) confirms what everyone now knows. The economy of Jackson County has been profoundly changing over the last thirty years. The traditional sectors of agriculture, forestry, and wood manufacturing has been slowly but steadily declining, while the trades and services sectors, associated with recreation, tourism and retirement has been steadily increasing. From 1970 to 1998, wood manufacturing employment has gone from 12.3 percent to 4.8 percent, a loss of 7.5 percent of workforce share. During the same time period, services have come to claim 22 percent of the workforce, an increase of 9.9 percent, while trade (retail) activities comprise 23.2 percent of the workforce, an increase of 5.5 percent.

Non-farm employment in the state increased by nearly 40 percent from 1986 to 1996. Construction, trade and services has seen the most growth, with four elements of services particularly noteworthy: 1) business services (including temporary help, supply firms, computer software, service companies; 2) engineering and management firms; 3) social services; and 4) health care. Most of the government growth has occurred at the local level, while federal jobs have declined, especially with natural resource management agencies (Anderson 1998: 22).

All net employment growth in Jackson and Josephine Counties in the last decade has been in non-manufacturing. Of these nearly 22,000 jobs, three-fourths of them have been in wholesale and retail trade and services. Spurred by population growth, such employment increased from 19,000 in 1987 to almost 25,000 in 1997, associated with new outlets opening in the area—Target, Costco, Wal-Mart, Fred Meyer, and Montgomery Ward, to name just a few (Anderson 1998: 25).

Oregon Economic Development (OED) projects 19,000 net new jobs in the Rogue Valley by the year 2006. Nearly 50 percent are projected to occur in professional and technical occupations and service jobs (teachers, education workers [+1,340], health care specialists and technicians [+1,050], social workers and social service technicians [+600]). Service workers include food and beverage preparation and service occupations (+2,200), and personal service workers (+540), the largest group of which will be social service aides and childcare workers (because of day care and assisted living demands). Almost 20 percent of new jobs is expected to be in production, construction and related occupations, with smaller job growth in clerical and sales workers. Agriculture, forestry and related jobs will experience the least job growth—timber cutters, loggers and other kinds of forestry employment will decline by another 20 percent, while the rest of agriculture and forestry occupations are expected to increase by 330 net new jobs (19%). Gardeners, groundskeepers, farm workers, and forest conservation workers (forestry aides and tree planters) are expected to gain the most new jobs (Anderson 1998: 32-33).

The Oregon Employment Department conducted a study of people who moved to southern Oregon in 1997. The major reasons they gave for doing so were: 1) to be with family and friends; 2) quality of life; and, 3) retirement. In contrast, for the state of Oregon as a whole, the third reason was to look for a job (Anderson 2000: 4).

The composition of personal income has also shifted in southern Oregon. The Oregon Employment Department's latest regional economic profile shows a continuation of a trend toward less personal income through wages and more personal income "dividends, interest, and rent" and through a higher rate of transfer payments. Net earnings for the two-county region dropped from 72 percent of personal income to 55 percent between 1967 and 1997. Correspondingly, dividends, interest and rent climbed to 23 percent of personal income, while transfer payments rose to 22 percent. Transfer payments are Social Security and other retirement payments, Medicare, and veterans' benefits. The growth in transfer payments indicates the strength of the retirement presence in southern Oregon. The decline in the proportion of earnings reflects the loss of higher paying jobs in heavy industry (Anderson 2000).

A Summary of Key Economic Sectors Affected by CSEEA Decisions

The relevance of this summary for CSEEA decisions is that southern Oregon in the future will be increasingly comprised of individuals with disposable income, higher education, and environmental values who will create recreation demand on public lands.

Timber

Four areas of activity fall under this category: traditional timber harvest, small diameter timber, restoration forestry and special forest products.

Timber will continue to be an important economic activity but will not be a significant source of new jobs or higher incomes. Value-added and secondary wood products manufacturing can be an important component of the economy but is unlikely to replace the timber industry in jobs and income produced (ECONorthwest 1999).

The causes of decline in forest-based employment in southern Oregon have been much debated over the last few years. Many people have felt that environmental activism has been the cause, and they point to the spotted owl injunction of 1989 as evidence of a dramatic decline in the availability of federal timber supply. Indeed, the amount of harvested board feet in the Siskiyou and Rogue National Forests, as well as the Medford District of the Bureau of Land Management (BLM) has never returned to the levels of the 1980s. However, other observers have pointed to another cause of employment decline in the lumber and wood sectors—industry restructuring. For example, by 1986 timber production had returned to prior rates from the recession of the early 1980s, but timber employment in that year for Josephine County was only 81 percent recovered. By 1993, Josephine County had only 54 percent of the timber employment that it did in 1978 (Reid and Flagg 1995: 29). In short, a variety of supply and demand factors is likely to limit the lumber and woods products sector in the future.

In practice, this means that timber sales emerging from federal agencies will be at reduced level than in years past, will include greater quantities of small diameter material, and will continue to be purchased by the remaining mills in the region.

Statistics confirm what Greensprings residents and others have said—private lands are accounting for more and more of annual timber harvest. Table 2-22 below shows a general downward trend in the amount of timber harvested in Jackson County over the last several years. It also shows a trend toward greater reliance on private land cutting.

Because of fire suppression and timber harvesting policies of the last few decades, southern Oregon forests have become dominated by highly dense stands of small diameter trees. To increase production levels and to promote forest health generally, land management agencies have been very interested in harvesting small diameter material. A number of pilot projects are underway in small diameter contracting and harvesting in the region. This management attention is giving rise to an increasingly visible secondary woods products industry.

Secondary wood processing creates specialty products with less volume of smaller diameter wood. These include millwork, dimension lumber, wood containers, prefabricated housing and miscellaneous products (SIC 243). Products created in

Table 2-22. Timber Harvest in Jackson County For Selected Years Thousands of Board Feet (Scribner Log Scale)

	1993	1994	1995	1996	1997	1998
Forest Industry	57,015	49,069	92,960	43,985	80,646	90,475
Other Private	36,958	25,943	29,132	13,501	13,234	8,997
State	35	12	0	0	5	0
BLM	38,644	5,960	18,275	28,037	20,701	21,028
USFS	37,495	32,346	22,041	19,798	26,720	10,680
Other Public	228	69	58	52	183	4
Totals	170,375	113,399	162,466	105,373	141,489	131,184
Total Private	93,973	75,012	122,092	57,486	93,880	99,472
% Private/Public	55/45	66/44	75/25	55/45	66/34	76/24

Source: Oregon Department of Forestry, Annual Oregon Timber Harvest Report, Salem, Oregon.

Jackson County include pole furniture, fencing, wooden gift boxes, carved art forms, lamps, tables, and other products.

In Jackson County for the production of secondary wood products (SIC 243, excluding plywood/veneer, 244-249), total payroll increased from $25,325,384 to $43,858,438 between 1985 and 1993, an increase of 74 percent. The number of workers during this time period increased from 1,389 to 1,825, an increase of 31 percent. The average payroll for this sector in 1993 was $24,032, the same as a high technology job. The average yearly salary for lumber and wood manufacturing in 1993 was $28,210 (Reid and Flagg 1995: Appendix D). Hence, secondary wood products manufacturing is holding its own in Jackson County and is expanding in importance.

A "restoration forestry" is emerging in southern Oregon. Fueled by federal efforts to retrain timber workers, and by state and federal efforts to restore salmon runs, the local area has received resources designed to do riparian repair, tree planting, thinning, weed pulling, and erosion control activities on both private and public lands. A number of individuals and at least one firm, Small Woodland Services, make their livelihood from contracting for restoration services from individuals and natural resource agencies.

Finally, special forest products have received much attention in recent years because of the high incomes their harvest can generate, as well as the social conflicts generated with large numbers of people, some of different ethnic backgrounds, engaged in harvesting. Cedar boughs, ferns, mushrooms, medicinal plants and firewood are among the many non-timber species harvested in the woods. Local merchants reported increased spending by workers during harvest periods. Mushrooms are a significant source of holiday income for a large number of local families. Organizing efforts have been undertaken to educate the workers about environmentally safe harvest methods, identification and marketing. Local discussion about creating a storage facility, or of organizing harvesters into a guild-like structure, have failed to materialize, and special forest products gathering continues to be an individual and family activity.

Agriculture

ECONorthwest reported that both the number of farms and the acreage in farms have declined in the region, while farm jobs have increased slightly due to value-added activities. Citing census data for agriculture, they noted that agriculture is claiming a lower percentage of overall employment over time (Niemi and others 1999: 15).

Between 1992 and 1997, Oregon farms increased in number and decreased in size. The number of farms now is 34,030, and the average farm size is 513 acres. Oregon farming is tremendously diverse, third in the nation after California and Florida in the range of its production. Farms in Western Oregon tend to be much smaller than the average and more intensive in use. The Agricultural Census also changed the definition of a farm which may have caused the number to increase as well. Christmas tree, pleasure horse, and hybrid/poplar operations are now considered to constitute a "farm."

Small farmers in Oregon overwhelmingly have other jobs and most operations do not make much money. About 62 percent of farms earn less than $10,000 yearly. Almost all farming in Oregon is family owned (Oregon State University Extension Service press release, May 5, 1999).

On the Greensprings, cattle grazing is the primary agricultural activity. Indeed, cattle and sheep grazing was the means of settlement of this area, providing livelihood for some families for many decades, but leading to overgrazing in some areas. The Taylor Grazing Act of 1934 and subsequent efforts have improved range conditions to a degree, although concerns about the effects of grazing remain high for both residents and environmentalists. The number of cattle permitted on public lands in the CSEEA area has declined significantly during the last several years. The Livestock Grazing section of this report summarizes these changes, current rangeland conditions, and the present number of people dependent on grazing allotments.

In both the region and the nation, the cattle industry has fallen on hard times during the last several years. Table M-5 shows that total cattle numbers in Jackson County have stayed relatively constant but the value of the industry has risen substantially, contributing nearly $8 million to the economy in 1996. In 1998, cattle and calves contributed $8.4 million to the Jackson County economy (Economic Information Office, Oregon State University, January 26, 1999).

Cattlemen could be affected by decisions made in the CSEEA because they have private business interest dependant on public lands. Poor market conditions over several years, lack of investment in public land allotments, declining animal unit months (AUMs) on public lands, and the lack of young people in the business point to a stressed industry.

Oregon State University does "enterprise budgets" for typical agricultural operations in the state. Certain assumptions are made about herd size, pregnancy rate, and mortality, as well as about expenses and incomes given current market conditions. While they have conducted no enterprise budgets for Jackson County cow/calf operations, their enterprise budgets for other areas of Oregon show a dismal financial picture. For a 50 cow/calf operation in the high desert area of Oregon in 1997, they projected an overall loss of $12,958 and a per cow loss of $259, despite a gross revenue of $18,162. For a 210 cow/calf operation on irrigated pasture in the Klamath Basin, they projected a net loss to the operation of $34,269 in 1996, and a per cow loss of $163, despite a gross revenue of $72,370 (EM 8653 and EM 8477, respectively, Oregon State University Extension Service, http://osu.orst.edu/Dept/EconInfo/ent_budget/). The latter example assumes an AUM cost of $7, while a BLM AUM on the Greensprings costs $1.34. Although this year has witnessed a rise in prices after a six-year low, no one expects dramatic changes in the near term.

Recreation and Tourism

Dean Runyan and Associates, in calculating the economic effects of tourism for the Oregon Tourism Commission, determined that Jackson County ranked 9th in the state for travel expenditures, although the county is 6th in population. They found that Jackson County travel spending grew 3.6% annually between 1991 and 1997, and 4.3% from 1996 to 1997. Travel expenditures were valued at $204.7 million in 1997 in Jackson County.

A 1995 study of outdoor recreation in Oregon showed that motorized recreationists (off-highway plus pleasure driving) spend on average $23.89/day, compared to $10.04 for non-motorized, dispersed users (Johnson and Rasker 1995). The Motorcycle Industry Council reported that sale of units was 453,000 in 1990 and 488,000 in 1993. Of this figure, off-highway motorcycles and all terrain vehicles (ATVs) accounted for 59 percent of sales, reaching $1.5 billion. In Oregon, motorcycles numbered 98,000 in 1997, of which 52,700 were on highway, 13,000 were dual sport (on and off highway), and 32,500 off highway. This means that 3.1 percent of the population in Oregon are motorcycle users (From a presentation by Terry Eccles, Oregon State Parks, to Johns Peak Recreation Committee, City of Jacksonville, Oregon).

The International Snowmobile Manufacturers Association reported 181,000 sales in 1994 and 258,000 in 1998, an increase of 43 percent (Press release, 7/22/98; www: snowmobile.org). The Oregon State Snowmobiler Association conducted a survey in 1994 of their 3000 members. They received 310 surveys back that showed spending patterns as follows:

Snowmobiles, $3,239,000 (per capita, $10,448); Trailers, $500,000 (per capita, $1,613); Tow vehicles, $3,000,000 (per capita, $9,677); Motels, $62,000 (per capita, $200); Food, $92,000 (per capita, $297); Clothes, $60,400 (per capita, $195).

Recreationists, shopkeepers and agency people interviewed for this report stated a common perception that most outdoor recreation on public lands in Jackson County represents local use. It is possible that more out-of-area visitors could be attracted to outdoor recreation opportunities in Jackson County. Data from Jackson County parks showed that Californian use of the Howard Prairie campgrounds has ranged from 5 to 14 percent over the years but is generally increasing.

The California State Department of Parks and Recreation commissioned a study in 1993 of the economic impacts of Off-Highway Vehicle use in the state. It found a family-oriented sport that generated $3 billion for the economy, with significant contributions to rural areas. The average spending per household, not including vehicle purchases, averaged $3,516 per year.

In the CSEEA area, BLM for years has assumed a 2 percent rate of growth in recreation demand. Although no documentation of use rates has been undertaken, the figure seems appropriate. A number of outdoor enthusiasts have pointed out that this area does not have the spectacular scenic beauty of other areas, but a number of other features do make it an attraction:

- It is known as a local area. Conversations with outdoor stores and with hikers reveal that the area is known as a local area. In the same way that the trades and services economy is fueled by a combination of a growing local population and by visitors, demand for recreation opportunities in the CSEEA areas will grow as well.

- It is accessible for day uses from the tourism market of Ashland. With a half-million visitors coming to Ashland to see the Shakespeare Festival alone, a good number of people take the time to explore local surroundings. Outdoor stores in Ashland stated that they often direct day hikers and sight-seers to the Pilot Rock and Greensprings areas.

- Its biological diversity is an attraction for students, academicians, and forest lovers from other regions. In the Illinois Valley, biological and geo-physical resources have begun to be a tourist draw in their own right (Preister, 1999), and some local residents believe a similar attraction could occur in the CSEEA area, especially with national designation.

- The Pacific Crest National Scenic Trail, and related opportunities to create regional links for equestrian, snowmobile and other uses, encourage recreational uses of the area.

A number of individuals and businesses depend directly or indirectly on the natural amenities provided by BLM lands in the CSEEA. Callahan's Restaurant and Lodge, Buckhorn Springs Resort, the Greensprings Inn and Lodge, Pinehurst Inn, Houghton College, and a fairly large artist community use the CSEEA lands for their livelihood. The Box R Ranch is creating a destination resort. The resorts at Hyatt and Howard Prairie Lakes, and Campers Cove, depend directly or indirectly on natural resource amenities.

Other Sectors

Appendix N summarizes two other sectors, medical services and the "modem cowboys"(global entrepreneurs), who are becoming a significant economic engine in rural areas of the U.S. West.

A Summary of Social and Economic Trends

Like other parts of the region, a trades and services economy has become dominant over the traditional sectors of timber, mining, and agriculture. These sectors tend to pay less than traditional sectors and help create families dependent on multiple income streams. Although a trades and services economy, especially one associated with tourism and recreation, pays low wages, this tendency is mitigated by the presence of retirement services, and particularly of medical services in Jackson County. Some social problems, such as latch key children and the need for youth outlets, can be created by a trades and services economy. A trades and services economy favors high levels of education and quality of life amenities, especially natural environment amenities.

Wage income as a percentage of total income generated in the valley has been declining. Conversely, transfer income associated with pensions, social security, and retirement benefits, as a percentage of total income in the valley, has been increasing as a function of the increased presence of older people in the population.

The number of people drawing economic livelihood from the global economy through computer modems, package delivery services and airports is high. These so-called "modem cowboys" or "lone eagles" are making serious, although unmeasured, contributions to the economy. These people live where they wish and rank quality of life considerations as highly important in choosing a place to live.

In the Greensprings area, there is now a more diverse mix of occupations than in prior generations. Some forestry workers remain, but commuters, professional people, self-employed cottage industry owners and retirees now have a presence as well.

Environmental Justice

Executive Order 12898 (1994) provides that "each Federal agency make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health and environmental effects of its programs, policies, and activities on minority populations and low-income populations." Environmental Justice "is achieved when everyone, regardless of race, culture, or income, enjoys the same degree of protection from environmental and health hazards and equal access to a healthy environment in which to live, work, and play" (Whorton and Sohocki 1996).

Conclusions

The Greensprings community has an avid interest in participating with BLM in developing management strategies for public lands near them. Community members have an interest in creating or sustaining livelihoods for their families derived from public land management. Their history is steeped in forest work and they believe that their stewardship ethic can create ecological soundness while re-creating a labor force capable of restoration forestry.

The profound social and economic shifts that have been experienced in southern Oregon during the last thirty years will affect the management of public lands. The emerging population is more numerous, older, more educated, and has more leisure time and disposable income. Preservation interests are likely to intensify because they are demographically generated by the settlement of ex-urbanites into the small towns of southern Oregon.

Recreation demand is likely going to increase across a wide variety of recreation opportunities—off-highway vehicle use, equestrian, hiking, driving tours, snowmobiling, as well as more "specialty niches" in the future, such as special tours or group events. Recreation demand will be driven from old as well as young, and by specialized populations, such as handicapped persons.

Newcomers have strong environmental values but are not well-acquainted with southern Oregon ecology. Local communities have had varying success in educating newcomers in how to take care of the land. In the Greensprings area, absorption and education of newcomers has been positive, although economics are driving continued logging of private lands. Demands for diverse educational opportunities related to forest management will grow.

The polar positions in regard to CSEEA decisions are preservation or production. Each position has articulate representatives. Many Greensprings residents and recreation enthusiasts believe that national designation of the area will create an attraction that will bring further recreational users into the area. They believe that designation on a map will create a destination area of the CSEEA area. For many this is positive and represents livelihood opportunities, while for others, increased recreation use should not be promoted (Soda Mountain Wilderness Council). Production-oriented people, on the other hand, like timber companies and ranchers, are worried about foreclosing options, both for their short-term interests and for the longer term interests of society. They think keeping options open is important for future flexibility. The Jackson County Commissioner representing natural resource issues has also voiced concerns that management options are kept open--ecological integrity can be sustained and still derive some level of human benefit.

Existing Condition of Designated Land Use Areas

Matrix Land

The Matrix consists of those federal lands that remain after the other (six) categories of land were designated during the RMP process. The other six areas designations are:

1) Congressionally Reserved
2) Late-Successional Reserves
3) Adaptive Management Areas
4) Managed Late-Successional Areas
5) Administratively Withdrawn
6) Riparian Reserves

Most of the Probable Sale Quantity (PSQ) for timber harvest is expected to come from the Matrix. It is the land that is linked into the Medford District's RMP timber sale volume commitment. The Matrix, Southern General Forest Management Area, objectives from the RMP (USDI 1995a p 38-39) are as follows:

- Produce a sustainable supply of timber and other forest commodities to provide jobs and contribute to community stability.
- Provide connectivity (along with other allocations such as riparian reserves) between late-successional reserves.
- Provide habitat for a variety of organisms associated with both late-successional and younger forests.
- Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- Provide early-successional habitat.

For specific Management Actions/Direction in the Matrix refer to the RMP (USDI 1995 p 39).

Of the 52,407 acres of BLM-administered lands in the proposed Oregon CSEEA, there are 9,389 acres designated as Matrix that are not in the other designated land use areas (i.e. RNAs, ACECs). Approximately 24 percent, or 2,256 acres, of the Matrix is commercial based forest land. General Plant Communities in the Matrix are shown in the Table 2-23. For a general description of the plant communities, see the vegetation section.

Table 2-23. General Plant Communities in the Matrix

General Plant Community	Acres	Percent of Matrix
Grass/shrub/woodland mosaic	5,428	58
Mixed conifer	3,744	40
White fir	217	2
Totals	9,389	100

Acreage figures do not include matrix lands with special designation such as Box-O Ranch (1,200 acres), WSA (5,867 acres), Scotch Creek RNA (1,719 acres), Mariposa Preserve (240 acres) or Pilot Rock ACEC (304 acres).

Timber

Total estimated standing volume, from the operations inventory, is approximately 67.8 million board feet (MMBF). A sizable portion of this volume is located in riparian areas. The majority of volume located in riparian is not available for harvest. Estimated standing gross volume, outside of riparian areas is 52.6 million board feet.

Special Forest Products

Other forest commodities, such as firewood, Christmas trees, Cedar boughs, and mushrooms are gathered and accessible provided they are near roads. Permits are issued for personal and commercial use.

Access

Approximately 156 acres comprising 3.4 MMBF of 2,256 acres of commercial forest land is not currently accessible without constructing new roads and/or acquiring new easements from private land owners. Most existing Matrix roads are natural surfaced, requiring hauling during the dry season. Some existing roads would require drainage improvement, including minor repair/ renovation for erosion control and safety.

Harvest Systems

Three general harvest systems are available for timber harvest: ground-based equipment, cable yarding systems, and helicopter logging. Approximately 41 percent of the area could be skidded using a ground-based logging system, 17 percent using a cable yarding system, and 42 percent would require helicopter yarding.

Current Stand Conditions

The vegetation has been influenced by timber harvest and fire suppression. Many forested stands need commercial and pre-commercial treatment. Many high relative density stands in the area indicate that the trees are physiologically at the point of suppression and mortality. High vegetation densities also suggest an increased potential for fire. Ecologically, many grasslands and oak woodlands have been mainly affected by shrub invasion, but also by conifer tree invasion. Fire suppression has allowed this succession pattern to proceed undisturbed and resulting in large tree mortality.

Under Matrix objectives, each forest stand would be evaluated of its need for vegetative manipulation. The following general objectives for silvicultural prescriptions are used in Matrix lands by the Ashland Resource Area.

- Reduce the density of all vegetation condition classes across the landscape to improve vegetation vigor and reduce the fire hazard while creating desired vegetation structural characteristics.
- Maintain and restore natural functions and processes necessary for the stability of ecosystem health and productivity.
- For the commercial forest stands, create stands with trees of varying size and age (diverse stand structure), and with various seral patterns across the landscape to promote mature/old-growth stand characteristics .
- Manage mature/old-growth timber stands to maintain their existence, structure, and function.
- Increase the species composition of earlier seral species (pine, cedar) into forest stands where appropriate.

Table 2-24. Current Stand Conditions in the Matrix

STAND CONDITION	Acres	Percent
Mature/old growth (21"+ DBH)	2,246	24
Mid Seral (11-21" DBH)	1,370	15
Poles (5-11" DBH)	325	3
Early Seral, Plantations	20	<1
Hardwood/woodland	2,454	26
Shrubs, Non-Forest	1,843	20
Grass, Forbs, Herbacrous	1,131	12

Acreage figures do not include matrix lands with special designation such as Box-O Ranch (1,200 acres), WSA (5,867 acres), Scotch Creek RNA (1,719 acres), Mariposa Preserve (240 acres) or Pilot Rock ACEC (304 acres).

- Create a favorable microenvironment for the natural establishment of seedlings by providing adequate available growing space and woody debris of various size classes.
- Reduce timber stand basal area to increase individual tree vigor, growth, and quality.
- Minimize impacts to the northern spotted owl and other sensitive species and their habitat.
- Maintain stream condition and stability in effected watersheds by maintaining appropriate stream buffers, by leaving trees in non-buffered draw bottoms, and by avoiding slumps or slide areas.
- Minimize soil compaction to maintain site productivity.
- Maximize the yield of merchantable wood from the stands by utilizing dead and dying timber while still meeting or exceeding the habitat requirements of snag/cavity dependent species.
- Maintain the integrity and functions of oak woodlands and shrublands and increase early seral stages of vegetation within.
- Address insect and disease infection within the project area and control where appropriate.

Table 2-24 that describes conditions based on the most dominate size class for commercial based conifer stands or described as grass, shrub, hardwood/woodland for non-commercial based stands.

Current and Potential Spotted Owl Habitat within the Matrix

In 1992, the Ashland Resource Area completed a 100 percent inventory and classification of all resource area lands as to their current suitability and potential for future suitability for use by spotted owls. The information sources for this classification were from current operations inventory, aerial photographs, biologists' knowledge of the stands, and field checks. Table 2-25 gives a breakdown of the acres in the matrix into one of the six habitat categories.

Table 2-25. Current and Potential Spotted Owl Habitat in Matrix Lands of CSEEA

Habitat Type	Acres	Percent
Type 1: Nesting - Optimal, meets all spotted owl life requirements.	466	3
Type 2: Roosting/Foraging - Meets requirements for spotted owl roosting, foraging and dispersal.	2,053	12
Type 3: Young Stands - Meets no known spotted owl needs currently.	550	4
Type 4: No Potential - Meets no known spotted owl needs.	12,926	74
Type 5: Dispersal w/potential - Currently provides structure believed to be important for spotted owl dispersal and has potential to become type 1 and/or type 2.	1,114	7
Type 6: Dispersal w/no potential - Currently provides structure believed to be important for spotted owl dispersal but, because of natural conditions, does not have the potential to become type 1 and /or type 2.	469	1

Table does not include Box-O (1,200) or Mariposa Preserve (240) acres. These areas were not been typed. For the complete habitat type definitions refer to the **spotted owl habitat section**.

Jenny Creek Late-Successional Reserve

Late-Successional Reserves (LSRs) are intended to be a network of existing and potential late-successional forests designed to protect and enhance mature and old-growth forest ecosystems. The reserves are designed to serve a number of purposes. First, they are intended to provide a well-distributed quantity of quality old-growth forest habitat. Second, they are intended to ensure that late-successional associated species will be conserved by providing late-successional forest habitat.

The structure and composition of these forests vary by forest type, site capability, and disturbance regime. Typically, stands include live old trees, standing dead trees (snags), and fallen trees or logs. The age at which a stand develops late-successional characteristics varies widely. In moist climates on productive sties, late-successional characteristics can develop in as early as 80 years. On dry sites, as typically found in Southwest Oregon, stands may be well over 150 years before these characteristics develop.

Management objectives for LSRs as stated in the Northwest Forest Plan Record of Decision (NWFP/ROD) are as follows: Late-successional reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl. These reserves are designed to maintain a functional, interacting, late-successional and old-growth forest ecosystem (ROD, C-11). These reserves should be protected from large-scale fires, insect and disease epidemics, and major human impacts. Management within LSR boundaries must be designed to meet this goal. The standards and guidelines of the ROD govern all management activities in the LSRs.

Assessment of Jenny Creek Late-Successional Reserve

The Jenny Creek Late-Successional Reserve (LSR) is located on public lands managed by the Bureau of Land Management (BLM) in southeastern Jackson County, Oregon in portions of Townships 39, 40, 41 South, Ranges 02, 03, 04 East (Willamette meridian). The LSR is located within the Western Cascades and Eastern Cascades physiographic provinces, and the Klamath physiographic province as defined in the Northwest Forest Plan (ROD A-3). As a result of the variation in physiographic characteristics the LSR is divided into four Ecoregions: Klamath River Ridges, Siskiyou Foothills, Southern Cascades, and Southern Cascade Slopes (Pater et al. 1997a and 1997b). The LSR extends south of Howard Prairie Lake to Soda Mountain and along the western portions of the Jenny Creek drainage to Agate Flat and the California border, west to the Soda Mountain Wilderness Study Area and the southern drainages of the Bear Creek watershed. The higher elevation white fir and mixed conifer forests are interspersed with brushfields and meadows. Grasslands, shrublands, and oak woodlands are found at lower elevations and south-facing slopes. The 34,554 acres of the BLM Jenny Creek LSR are interspersed with 32,245 acres of private lands for a total of 66,799 acres. The public ownership pattern is typical of the western Oregon BLM "checkerboard"of the old O & C Railroad lands.

The Jenny Creek LSR is complex in that it is composed of four Ecoregions that are defined by a number of site factors, most notably the general plant communities. Each Ecoregion will require different treatments and activities (Jenny Creek Late-Successional Reserve Assessment,USDI 1995b, Ch 4) related to the Owl Habitat Types (modified McKelvie system) listed in *Jenny Creek Late-Successional Reserve Assessment* (USDI 1995b, Ch 2). Existing suitable owl habitat is fragmented by ownership patterns, past management activities and naturally unsuitable lands in this LSR. Currently 10,525 acres (31 percent) of suitable owl habitat is found on BLM lands within the LSR. Another thirty-one percent of BLM lands is potentially suitable (table 2-26). Fifty percent of the BLM land in the Jenny Creek LSR in suitable habitat is a reasonable long term goal. The assessment resulted in the following objectives listed by priority for the LSR to attain this goal.

Objectives that will guide the process for development and application of LSR treatments.

Table 2-26. Current and Potential Spotted Owl Habitat in LSR Lands of CSEEA

Habitat Type	Acres	Percent
Type 1: Nesting	3,220	9
Type 2: Roosting/Foraging	7,401	22
Type 3: Young Stands	3,213	9
Type 4: No Potential	12,329	36
Type 5: Dispersal w/potential	7,591	22
Type 6: Dispersal w/no potential	800	2
Total existing and potential habitat (types 1,2,3,5)	21,425	62

-For the complete habitat type definitions refer to the spotted owl habitat section.

I. Protect, enhance, and rehabilitate early and mid-seral plant communities that will develop into LSOG.
II. Protect and maintain LSOG habitat from catastrophic threats (i.e., large scale disturbances).
III. Promote connectivity of LSOG habitat within and adjacent to the LSR.

IV. Maintain, restore, and protect watershed functions and natural structures that result in high quality habitat for native fish and other aquatic organisms.
V. Promote and enhance non-forest plant communities and botanical integrity.
VI. Promote and enhance biodiversity in special use areas.

The *Jenny Creek Late-Successional Reserve Assessment* contains a series of proposed treatments and activities by ecoregion related to owl habitat types. These activities and treatments are thought to be consistent with LSR objectives as stated in the NWFP/ROD. Maintenance and protection treatments proposed in stands greater than 80 years old are considered site specific and will be reviewed by Regional Ecosystem Office (REO). The general guidelines described in *Jenny Creek Late-Successional Reserve Assessment* (chapter 4) are intended as standards to be followed during the planning of projects in the LSR.

Timber

Total estimated standing volume, from the operations inventory, is approximately 142.9 million board feet. Most of the volume will not be available given constraints due to enhancement of old-growth habitat (i.e. the LSR objectives and management guidelines). The following tables list the general plant communities (table 2-27) and current stand conditions (table 2-28) in the LSR.

Table 2-27. General Plant Communities in the Jenny Creek LSR

General Plant Community	Acres	Percent of LSR
Mixed conifer	19,550	57
White fir	2,476	7
Pine domination	2,283	7
Juniper domination	1,643	5
Grass/shrub/woodland mosaic	8,515	24
Semi-wet/wet meadow	87	< 1
Totals	34,554	100

Table 2-28. Current Stand Conditions in the Jenny Creek LSR

Stand Condition	Acres	Percent
Mature/old growth (21"+ DBH)	20,205	59
Mid Seral (11-21" DBH)	6,359	19
Poles (5-11" DBH)	2,163	6
Early Seral, Plantations	1,654	5
Hardwood/woodland	1,737	4
Shrubs, Non-Forest	432	1
Grass, Forbs, Herbaceous	2,006	6
Totals	34,554	100

Scotch Creek Research Natural Area

The Scotch Creek RNA is a 1,797 acre parcel located in southeastern Jackson County along Scotch Creek, a tributary of the Klamath River that flows into Iron Gate Reservoir through the Horseshoe Ranch Wildlife Area (California Department of Fish and Game and Redding Resource Area, BLM) (map 2). Scotch Creek flows to the southeast from the ridge that separates the Klamath and Rogue River watersheds. The RNA is bounded on the north by Schoheim Road (BLM Road 41-2E-10.1), on the west by Slide Ridge, on the east by Lone Pine Ridge, and the Oregon-California border on the South. The Schoheim Road forms a common boundary between the Scotch Creek RNA and the Soda Mountain Wilderness Study Area to the northeast. The small parcel (75 acres) of privately owned land is isolated at the southeast corner of the RNA (T.41S.,R02E.,Sec.16) was recently given to the U.S. Department of the Interior by the Soda Mountain Wilderness Council. This parcel will be incorporated into the Scotch Creek RNA.

Establishment

Scotch Creek RNA was established for scientific study and as a baseline study area for two Oregon Natural Heritage Program cells represented in the Scotch Creek Drainage: a Rosaceous type dominated by Garry oak (*Quercus garryana)* (not mentioned in the original nomination) , Klamath plum (*Prunus subcordata*), western chokecherry (*P. virginiana*), bitter cherry (*P. emarginata*), and birchleaf mountain-mahogany (*Cercocarpus betuloides*) and a different chaparral community dominated by buckbrush (*Ceanothus cuneatus*), manzanita (*Arctostaphylos* spp.) and birchleaf mountain-mahogany (*Cercocarpus betuloides*).

RMP Management Restrictions

The Medford District RMP (USDI 1995a) established the following management requirements on the Scotch Creek RNA. The RNA is closed to OHV use and mineral entry. Minerals leasing is subject to no surface occupancy (NSO). The RMP is silent on the issue of timber harvest.

Topography

Scotch Creek is in a northwest/south east trending steep sided valley that extends from Pilot Rock and Porcupine Mountain on the Rogue/Klamath Divide to the Klamath River where it empties in Iron Gate Reservoir. The watershed is bounded on the west by Slide Creek/Hutton Creek Ridge and the east by Lone Pine Ridge. The west and east fork of Scotch Creek meet at the end of a narrow ridge just above the waterfall on Scotch Creek main stem. Slide Creek, a subset of the Scotch Creek watershed enters Scotch Creek in the Horseshoe Ranch Wildlife Area in California. The elevation of Scotch Creek in the RNA varies from 3,960 feet on the east fork of Scotch Creek at the Schoheim Road and 3,840 feet on the west fork of Scotch Creek at the Schoheim Road to 3,080 feet at the lower boundary of the RNA at the California border. Highest elevations in the drainage are 5,908 feet at Pilot Rock, 5,200 feet at Porcupine Mountain, 5,403 feet on upper Lone Pine Ridge. Lone Pine Ridge is 3,640 feet at the California border, Slide Ridge, 4,000 feet. West facing slopes are characterized by open grasslands with oaks in the draws and densely vegetated east facing slopes dominated by small oaks and brush. The 30 foot waterfall on the main stem of Scotch Creek is a special topographic feature that prevents the upstream migration of fish.

Geology

Scotch Creek RNA is mapped as Western Cascade Oligocene basalt, basaltic andesite, and andesite (Tb2) (Smith and others 1985). These flows are interbedded with volcanic breccias and pyroclastic deposits and other rock types too thin, discontinuous, or poorly exposed to map separately. Different rock types in these formations are not mapped because of the scale of the map and the complexity of the formations. Pilot Rock, at the head of the Scotch Creek watershed, and Cathedral Cliffs just to the east of Lone Pine Ridge on Camp Creek are mapped as mafic intrusive rocks (Tm) and are outside the present RNA boundaries (Smith and others 1985).

Soils

Soil information for Scotch Creek RNA is based on the Soil Survey of Jackson County Area, Oregon (USDA Soil Conservation Service, 1993). There are six mapped general soil units in the RNA (map 31). Because of the small scale of the map and the large area covered, mapped units are often presented as complexes of different soil types. Number of acres, percent of RNA, productivity class and site index (if any) of the soil types found in the RNA are summarized in table 2-29. About 79 percent of the RNA consist of clay or rock outcrop soil complexes. The balance (21%) are soil types capable of supporting mixed conifer stands.

Hydrology

Scotch Creek watershed is 11,503 acres (18 sq. mi.), 61 percent of the ownership is BLM, 30 percent State of Oregon, and 9 percent private. There are 109.5 total stream miles with a stream density of 6.1 miles per square mile. In the watershed, there are 4.7 miles of fish-bearing streams, 5.5 miles of perennial non-fish bearing streams, 60 miles of intermittent streams and total of 70.2 miles of stream with riparian reserves (USDI-BLM 1999). There are no mapped springs on the Siskiyou Pass or Soda Mountain USGS 7.5 Quad maps, except for two adjacent springs at the head of the east fork of Scotch Creek below Porcupine Gap.

Table 2-29. Scotch Creek RNA Soil Units

Soil #	Unit Name	Percent Slope	Acres	Percent Acres	Productivity Class *	Site Index **
14G	Bogus very gravelly loam, north slopes	35 to 65	323.2	18.1	***PSME 70 PIPO 90	6 6
81G	Heppsie clay, north slopes	35 to 70	151.9	8.5	-	-
82G	Heppsie-McMullin complex	35 to 70	403.5	22.5	-	-
113G	McMullin-Rock outcrop complex	35 to 60	865.6	48.4	-	-
114G	McNull gravelly loam, north slopes	35 to 60	15.2	0.8	PSME 80	7
116E	McNull-McMullin gravelly loam	12 to 35	15.2	0.5	PSME 70	6

(USDA,1993)*Site Index. Height and age of selected trees in stands of a given species. A designation of the quality of a forest site based on the height of the dominate stand at an arbitrarily chosen age. Average height at 50 yrs = 75 feet. SI is 75. Age varies with species and soil type: 100 yrs. PSME on Pokegama and Woodcock units, PIPO all units; 50 yrs. PSME on all other units, ABMASH, and ABCO. ** Productivity Class. Yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands. ***PSME = *Pseudotsuga menziesii*, Douglas-fir; PIPO = *Pinus ponderosa*, ponderosa pine; ABCO = *Abies concolor*, white fir.

There is little data available on water quality or quantity in Scotch Creek, except for Parker (1999). He found that water temperatures varied from 9-9.5°C at cold water inputs to 14.5-16.5°C at a pump chance and in open meadows near the upper reaches of the stream. Temperatures ranged from 10.0-11.5°C throughout the rest of the stream. In 1999, when his survey was done, Scotch Creek was intermittent above the junction of the two forks, permanent below.

Water quality in the RNA has probably been affected by past logging and road building in the upper reaches of both forks in the past. The decommissioned Porcupine Gap/Schoheim Road connector traveled down the upper portions of the east fork of Scotch Creek in the riparian zone beside the stream. The Schoheim road and its culvert crossings particularly at the east fork of Scotch Creek impacted water quality by upstream impoundment and road runoff.

Scotch Creek watershed climate is affected by the continental climate of the Great Basin and by more moderate wetter oceanic influences from the west. The climate is more like that of the Shasta Valley to the south than the Rogue Valley to the north. The south facing slope of the Klamath/Rogue divide is warmer and drier than the north facing slopes. The transient snow zone is probably higher and snowpack may not remain on the ground as long as that estimated for the Jenny Creek watershed. Precipitation may vary from a low of 20 (19.8 at Copco, 22.5 at Siskiyou Summit) inches at lower elevations to as high as 30 (31.7 at Howard Prairie) or more inches per year along the Soda Mountain/Pilot Rock Ridge.

The area is characterized by long, hot dry summers, and relatively mild, wet winters and is subject to occasional summer thunderstorms. Periodic floods of some magnitude occur when warm wet storms melt existing snow pack.

Vegetation

Scotch Creek RNA was established on the basis of a large area of chaparral dominated by members of the Rosaceae (*Prunus* species, *Amelanchier, Cercocarpus, Holodiscus*) primarily located on the east-facing slopes of Slide Ridge. The grassy, west-facing slopes of Lone Pine Ridge contained stands of perennial native grass which were dominate grassland species in former times. Little was known of the nature of the plant communities and their plant species.

Brock and Callagan (1999b) conducted a general inventory of plant community types in April-August 1999 that greatly increased our knowledge of Scotch Creek RNA plant communities. A list of plant species is provided in Appendix O. They point out several interesting floristic features of the RNA. Poison oak occurs at a single location, in a steep rock outcrop formation in the far northeast corner of the RNA. Poison oak is common at similar elevations both north and south of the RNA. Madrone is also absent, although it is common in the Rogue River watershed to the north. The grasslands contain native perennial grasses with low cover. Small areas of nearly pure Idaho fescue and bluebunch wheatgrass were found. Other grasslands best described as "mixed annual-perennial dominance" have 10-15 percent cover of native species. They also describe an important broadleaf maple-black oak forest riparian community associated with the perennial Scotch Creek stream system.

In their study they distinguished 11 different community types of varying degrees of cohesiveness of five different types: Riparian, Garry oak woodland, Grassland, Chaparral, and Conifer. Map 32 shows the distribution of the community types in the RNA. The following description is taken with some modification from Brock and Callagan (1999b).

Riparian Community Types

Two riparian communities are present: one dominated by trees; another by shrubs.

California Black Oak-Bigleaf Maple Riparian Woodland

This distinctive riparian woodland type occupies a wide zone in the alluvial bottoms of Scotch Creek and a more narrow zone in the lower reaches of several of the smaller side streams. On Scotch Creek these woodlands extend upslope on cool aspects for 100-200 feet above the creek bottoms. The alluvial soils sometimes form wide low terraces. Elevations range from 3,000 feet to 4,400 feet. This riparian zone forms a major wildlife corridor through the RNA.

Bigleaf maple (average 38% cover), black oak (18%) and Garry oak (16%) dominates the tree layer with occasional Douglas-fir, ponderosa pine and rarely black cottonwood or white alder. The shrub layer is usually dense with mock orange, tall Oregon grape, tall snowberry and serviceberry. The herb/grass layer varies, typically dominated by *Claytonia spp., Galium aparine, Tonella tenella, Vicia americana* and, in drier spots, *Bromus sterilis*. Two special Status species are associated with this type, *Ribes inerme ssp. klamathense* and *Isopyrum stipitatum*.

Riparian Shrub Community

On the middle and upper portions of the many tributaries which dissect the west slopes of Lone Pine Ridge (and the entire reaches of the southern-most tributaries that traverse the rocky "Lower Slope Complex") is a distinctive shrub-dominated community which typically occupies a very narrow band (50 ft. wide) with dry grasslands or rock outcrop beyond its margins. These riparian zones typically also have open exposed stretches between shrub patches. Most of these streams are perennial. A very high level of butterfly activity was observed at these sites.

Garry oak and western juniper are usually present with low percent cover. Mock orange (average 40% cover) dominates the shrub layer with willow, tall Oregon grape, and chokecherry common. *Rosa californica* is occasional. The herb layer is dominated by *Mimulus guttatus* and *Trifolium variegatum* (in the aquatic zone) with *Bromus sterilis* and *Poa bulbosa* (on the drier margins). Howell's false-caraway *(Perideridia howellii)* is common.

Garry Oak Woodland Type

Brock and Callagan (1999b) describe a single oak woodland type.

Garry Oak /Tall Oregon Grape Woodland

While white oak is a common co-dominant species in virtually all of the forest and chaparral plant communities in the RNA, it forms nearly pure stands in much of the area; these areas are mapped as Garry oak woodland. This type is found in several situations; it forms the outer margin of the riparian woodlands, extending upslope when soil depth allows; it extends up sidestream canyons in wide bands, it forms patches in open grassland communities (apparent clonal patches), and it is a component of the large chaparral-complexes which cover the upper slopes of Lone Pine Ridge and the east slopes of Slide Ridge. It occurs on Bogus (very gravelly loam) and Heppsie (clay) soils.

White oak cover is nearly always very dense (average 85%). Western juniper is often present at low cover. California black oak is present in draws or moist areas. The shrub layer is dominated by tall Oregon grape and tall snowberry with covers of each averaging 10-12 percent. Klamath plum and chokecherry are often present. The herb layer is variable depending on the density of the shrub layer; where shrubs are dense, the herb layer is sparse. The herb layer cover varies from under 10 percent to over 50 percent. Typical species include *Claytonia, Nemophila parviflora, Viola sheltonii, Bromus* *sterilis, Yabea microcarpa, Lithophragma parviflora* and *Marah oreganus. Isopyrum stipitatum* is fairly frequent. This white oak woodland is not adequately described in current plant association guides for southwest Oregon.

In much of this community the oaks are dense and stunted, averaging 15-20 feet in height. Stems in many of these stands are 60-70 years old with diameters of only 4-6 inches. Occasional large trees are encountered but small diameter trees are the rule. Apparently, these stands developed under a frequent fire regime. It is possible that many of the patches are clonal and of very great (undeterminable) age. Many of the more stunted trees bear a resemblance to *Quercus garryana* var. *breweri* but the length of the leaves consistently indicates that these are var. *garryana*.

Rock Outcrops

Rock outcrops are sparsely vegetated with the most frequent species being *Juniperus occidentalis, Prunus subcordata, Bromus tectorum, Pseudoroegneria spicata, Alyssum alyssioides, Penstemon deustus* and *Lomatium californicum*. At higher elevations, *Sedum obtusatum* is common. A large population of *Woodsia oregana* also occurs at the higher elevations. A large sprawling member of the Hydrophyllaceae, *Phacelia ramosissima* var. *eremophila*, interesting eastern Oregon species, was found in protected (shady) areas of rock outcrops. The distinctive Scotch Creek RNA rock outcrop plant community is frequently associated with grassland complexes and with outcrops in tree and shrub dominated communities.

Grassland Types

Brock and Callagan (1999b) recognize grassland complexes based on elevation and their association with rock outcrops or Garry Oak Woodlands.

Low Elevation Grassland-Rock Outcrop Complex

Lower elevations have a well defined zone which is significantly more shallow and rocky than higher elevations. The zone's upper limit is at approximately 3,350 ft. elevation, the same elevation as the major waterfall on Scotch Creek and the series of rock outcrops west of Scotch Creek. This may represent a geological break between old and "new" volcanic flows. Soils are all classified as McMullin-Rock Outcrop Complex (the proportion of rock outcrop is quite high). The elevation ranges from 3,000-3,350 feet. This grassland here forms a mosaic with rock outcrop communities, white oak woodland and wedgeleaf ceanothus-Klamath Plum chaparral in approximately the following proportion:

20% -- Rock Outcrop
60% --Dry grassland
15% --White Oak Woodland
5% --White Oak / Klamath Plum-Wedgeleaf Ceanothus Chaparral

The grassland component in this area is dominated by annuals with a regular low cover of bluebunch wheatgrass. It differs significantly from the mid to upper slope grasslands in several respects including:

- dominance by *Bromus tectorum* and *B. japonicus*
- *Bromus hordeaceus* much less abundant.
- high frequency of *Prunus subcordata*
- high frequency of *Lomatium californicum*
- higher frequency and cover of *Lupinus albifrons*
- very low frequency and cover of medusahead (*Taeniatherum caput-medusae*)
- low frequency of star thistle
- relatively higher frequency and cover of *Agoseris heterophylla, Lomatium macrocarpum* and *Trifolium ciliolatum*.

The area is on a southeast aspect with significant due south and due west aspects represented. On the east slopes of Slide Ridge are several small rock outcrop openings which should be classified as this type though several of these support dense stands of Idaho fescue which is sparse east of the creek where heavy grazing has been continuous for 150 years. Significant surface erosion has occurred due to grazing but no rills or gullies are obvious. The surface layer is very gravelly with 30-50% exposed gravels and soil.

Middle and Higher Elevation Grassland-Garry Oak Woodland Complex

Soils are significantly deeper, slopes tend to be more moderate with occasional "bench" topography above approximately 3,350 feet elevation. The grasslands here tend to have denser cover than the lower grasslands. Most of the area is still dominated by annual grasses and forbs. Idaho fescue or bluebunch wheatgrass dominates the occasional patch of grass. However, patches of star thistle which is rapidly moving-in from the south and east are more frequent.

All soils are McMullin-Rock Outcrop Complex although the proportion of rock outcrop is much lower than in the Lower Grassland Complex. Elevation ranges from 3,350 to 4,200 feet. The plant community is on a southwest aspect with significant due south and due west aspect represented. Significant surface erosion has occurred due to grazing but no rills or gullies are obvious. The surface layer is gravelly with 20-30 percent exposed gravels and soil. The type is a mosaic of grassland with white oak woodland and a small amount of wedgeleaf ceanothus- Klamath plum chaparral.

5% -- Rock Outcrop
65% -- Dry grassland
18% -- White Oak Woodland
2% -- White Oak / Klamath Plum-Wedgeleaf Ceanothus Chaparral

Astragalus californicus, a species previously considered "possibly extinct in Oregon", was found in this grassland community. It is often associated with fairly dense patches of bluebunch wheatgrass. This is the only known Oregon location for this species.

This community is at serious risk of further invasion by star thistle. Many incipient populations are present in the northwest half of the area. The southeast half is already infested by large star thistle populations. The soils have the right combination of adequate depth and periodic exposure (through erosive mechanisms) to allow for the continued spread of starthistle. This should be considered the biggest threat to the integrity of the community.

Chaparral Types

Brock and Callagan (1999b) discovered that the eastern Siskiyou rosaceous chaparral for which the RNA was established consists of three relatively distinct plant communities.

Garry Oak/Klamath Plum-Wedgeleaf Ceanothus

This community is a minor component of the RNA, occurring on the lower and middle slopes of the west aspects of Lone Pine Ridge and extending south across the Oregon/ California border. It is a typical dry-site chaparral but appears to be fairly localized in occurrence. It differs significantly from similar communities in the Applegate Valley because poison oak is absent here. This community may extend up the Klamath River Canyon to the east.

Garry oak is always present, usually in shrub form, at a cover which can vary widely depending on soil depth. Wedgeleaf ceanothus and Klamath plum are both usually present with covers averaging 23 percent and 57 percent, respectively. Klamath plum is clearly the more abundant species on most sites. Birchleaf mountain mahogany is common at the higher elevations with covers of up to 5 percent. Annual grasses (*Bromus japonicus, B. tectorum* and *B. mollis*) dominate the grass/forb layer with frequent *Lomatium californicum, Claytonia perfoliata* and *Dichelostemma capitata.*

The soils supporting this type are classified as McMullin-Rock Outcrop complex. Elevation ranges from 3,000 to 4,000 feet. The aspect is south to southwest. Slope position is lower to mid-slope. This community typically has very gravelly surface soils.

Garry oak/Mountain Mahogany-Klamath Plum Chaparral Complex(Lone Pine Ridge)

The upper slopes of the west face of Lone Pine Ridge are covered with a dense chaparral consisting of a mix of white oak, birchleaf mountain mahogany, with a regular presence (but low cover) of Klamath plum. Some areas are dominated by white oak with reduced levels of mountain mahogany; other areas are dominated by mountain mahogany with white oak cover reduced; much of the area is a more or less equal mix of these two. Where mountain mahogany is the dominant (and white oak cover low), canopy gaps are frequent and the herb layer is significantly more dense as well as more diverse with several dry-site (grassland) species occurring in the canopy gaps. Most of the area is very dense and extremely difficult to walk through.

Throughout the area, the dominant herb-layer species are *Claytonia* (both *perfoliata* and *parviflora*), *Galium aparine*, and *Nemophila parviflora*. These species are the same as are found to be dominant in the White Oak Woodland type and in the chaparral on Slide Ridge. However, Three other species are found in high frequently in this complex; *Hydrophyllum occidentale* (average 2% cover), *Osmorhia chilensis* (1%) and *Clarkia rhomboidea* (average 2% cover). These elements are significantly different than the Slide Ridge chaparral complex.
The complex consists of roughly the following proportions:

40%	"Mixed Type" with white oak averaging 60 percent cover and mountain mahogany averaging 50 percent cover with 3 percent chokecherry and 3 percent Klamath plum and with 4 percent tall snowberry. This type closely resembles some of the drier, mountain. mahogany dominant chaparral) found on Slide Ridge.
30%	"Dry Type" with Mountain mahogany averaging 65 percent and white oak averaging 5 percent. Klamath plum is usually present a 1 to 2 percent cover. Chokecherry and snowberry are usually absent. This type has frequent small open spots with dry-site species such as *Collomia granidflora, Bromus sterilis, Lomatium californicum* and *Eriophyllum lanatum*.
10%	White Oak Woodland: see separate description for the type; it occurs here fairly randomly often in the form of a large (apparent) clone in the middle of one of the other types.
10%	Grassy openings; with typical mid-slope annual-grassland species; star thistle was not seen in this part of the RNA.
10%	Rock outcrops

There does not seem to be any apparent aspect affinities in this complex except that the "Dry" Type (mountain mahogany dominant) seems to prefer the more southerly aspects. For the most part, the types are apparently randomly mixed.

The soils supporting this type are mapped as Heppsie-McMullin complex. The elevations ranges between 4,200 and 5,100 feet. The aspects is mainly southwest with some due west and some due south.

Garry oak/ Mountain Mahogany-Snowberry Chaparral Complex (Slide Ridge)

On the entire east slope of Slide Ridge (west of Scotch Creek) is a complex similarly dominated white oak and mountain mahogany but is more moist than the Lone Pine Ridge complex. There is considerable variation in species composition across the slope and some patterns are discernable. However, there are no clear delineations, and all of the "types" more or less intergrade. The vegetation is fairly uniformly short-statured (10-20 feet in height) and moderately dense. It can be traversed on foot with reasonable ease, though fairly slowly. The tree/shrub layer cover is consistently high, averaging 90 percent. White oak is always present with an average cover of 54 percent. Mountain mahogany is usually present with an average cover of 30%. Snowberry is usually present with an average cover of 18 percent. Serviceberry, tall Oregon grape, Klamath plum and chokecherry all have high frequency and average 2-9 percent cover. Mock orange (*Philadelphus)* and Indian plum *(Oemleria)* occasionally occur. *Claytonia* (*perfoliata* and *parviflora*) and *Galium aparine* dominate the herb layer with *Smilacina racemosa* usually present. Other high frequency species include *Nemophila parviflora, Viola sheltonii* and *Clarkia rhomboidea.* This complex differs from the Lone Pine Ridge chaparral complex in the consistent high cover of snowberry (average 18%), the consistent presence of *Smilacina racemosa* and *Viola sheltonii* and the significantly lower cover of *Hydrophyllum, Clarkia rhomboidea* and *Osmorhiza chilensis.* It also lacks the dry grassland species which are fairly frequent in the Lone Pine Ridge chaparral.

While it is difficult to distinguish distinct types in this complex, there are some patterns which can be described. The complex is roughly composed of the following mix of community types:

40% White Oak-Mt. Mahogany; White Oak Dominant: This type averages 60-70 percent white oak and 20 percent mountain mahogany with 20 percent snowberry; it is fairly moist and occurs on northeast, east, southeast aspects.

20% White Oak-Mt. Mahogany- Mt. Mahogany dominant: This type averages 30-35 percent white oak and 60 percent Mountain mahogany with snowberry much less abundant; it is fairly dry and usually occurs on southeast aspects. This type is closely related to the "mixed" type of the Lone Pine Ridge upper complex.

10% White Oak Woodland: see the separate description for this type. It occurs here on east and southeast aspects, typically on lower slope position..

5% Riparian: in each of the small draws which dissect the area there is a narrow band dominated by dense *Philadelphus,* with *Holodiscus* and occasional bigleaf maple.

5% Rocky grassy openings: typically on southeast aspects, often with a strong native Idaho fescue component.

20% Sites with Douglas-fir-White Oak or Douglas-fir/Serviceberry-Oregon Grape conifer potential are mostly currently dominated by white oak (40-50% cover), mountain mahogany (20-25% cover) and snowberry (32% cover) like the previous two types, but also have consistent serviceberry cover (20%). Also distinctive in this more moist type is the regular presence of chokecherry, baldhip rose, silktassle, *Oemleria, Lonicera ciliosa* and occasional thimbleberry. The herb layer also has some distinctive species such as *Trientalis latifolia* and *Moehringia macrophylla* which are both usually present with a 2 percent cover. Douglas-fir, black oak and ponderosa pine are present in some of the areas. The potential for some of this area is for a open canopied Douglas-fir or ponderosa pine overstory with white oak or black oak in the understory and continued fairly dense shrub layers. Some areas are trending toward the Douglas-fir/Serviceberry-Oregon Grape (PSME/AMAL-BEPI) type. Other areas seem to be more trending toward keeping Garry oak as a co-dominant. It is probable that most of this area has not seen much more than scattered conifers for a long time due to repeated fires, but given enough time without disturbance, the conifer component would develop. This does not mean that the area "should" be pushed toward conifer dominance, it just means that the ecology of the area is more difficult to interpret than was formerly thought. These conifer-potential sites are on north and northeast aspects, often clearly delineated by ridgelines.

The soils in this area are mapped as Bogus very gravelly loam with large inclusions of Heppsie-McMullin complex. Aspect includes north through southeast with northeast dominant. The elevation ranges from 3,000 feet to 4,100 feet.

Conifer Types

Two distinct conifer communities are present in the RNA.

Douglas-fir/Serviceberry-Tall Oregon Grape

This plant association occasionally occurs in the Applegate Valley (though in limited areas). Brock and Callagan (1999a) use this name for this particular Scotch Creek RNA plant community. They have not seen it in the Southern Cascades except in this area. The community is characterized by a lack of white fir, a consistent cover of serviceberry and tall Oregon grape and a lack of poison oak (the latter is not unique here, of course, but in the Applegate Valley its absence would be quite distinctive for the Douglas-fir series). Even though Scotch Creek RNA has totally different soils, this community appears to be nearly identical to the stands found in the Applegate Valley, west of the planning area.

The community occurs on north and northeast slopes mostly at the north end of the RNA. Soils are mapped as Bogus and McNull gravelly loams.

Some of the conifer stands on Slide ridge, currently dominated by ponderosa pine, are probably best combined with this community. High black oak cover, low Garry oak cover and a regular, fairly dense cover of serviceberry and Oregon grape are good characteristics to use identify the community.

White Fir/Dwarf Oregon Grape

This type occupies a small portion of the RNA, at the north end near the east fork of Scotch Creek and at the summit of Lone Pine Ridge on a northeast aspect. The soils are McNull gravelly loam and Farva cobbly loam. Conditions are cool and moist and soils are sufficiently deep to support dense conifer growth. This area represents the lower edge of a typical forest type in the area to the north outside of the RNA. White fir is dominant with an average of 60 percent cover; Douglas-fir is co-dominant (30%). The shrub layer has dwarf Oregon grape (24% cover). The herb layer has *Smilacina stellata* (3%) and *Trientalis latifolia* (2%) as dominants.

Alien Plants

There are a number of alien plants (annual grasses) and starthistle a noxious weed in the Scotch Creek RNA. Because of disturbed soil, past grazing practices, and the adjacent Schoheim Road the RNA is at risk to invasion by other weeds, most immediately dyers woad.

Starthistle:

Brock and Callagan (1999b) consider the active invasion of starthistle in the mid to high elevation grassland communities to be the main management concern in the RNA. They have discovered that approximately 200 acres in the southeast portion of the RNA is currently seriously infested with star thistle. About 10 percent of that area is heavily infested while 30 percent has light to moderate cover. Patch size varies from 200 sq. ft. to up to 2 acres. Another 200-300 acres of similar habitat is vulnerable to invasion in the near future. Incipient populations are also present along the Schoheim Road. A plan must be developed to slow this invasion. South of the state line fence in California the situation is much worse with most of the grasslands already occupied by star thistle. This area will continue to act as a seed source. Annual-dominated grasslands offer a fertile place for establishment due to the periodic availability of bare soil. One strategy for management may be to establish a higher level of native grass cover to limit the bare soil available for star thistle.

Dyer's Woad

This noxious weed was recently collected along Lone Pine Ridge Road above the Schoheim Road less than 1,500 feet up hill from Scotch Creek RNA. This noxious weed has the potential to colonize dry hill sides very rapidly.

Medusahead

Brock and Callagan (1999b) found that low elevation grassland were somewhat resistant to invasion by medusahead that they attributed to shallow soils. They suggest that these might be good areas to seed with bluebunch wheatgrass and Idaho fescue.

Special Plants

In addition to their plant community study, Brock and Callagan (1999a) surveyed for special status plants. They found seven species listed by ONHP (Table 2-30). The listing of Saw-tooth sedge (*Carex serratodens*) is tentative, awaiting confirmation.

Brock and Callagan searched the Scotch Creek RNA for three other plants with special status in Oregon, Ashland thistle (*Circium ciliolatum*), Gentner fritillary (*Fritillaria gentneri*), and Siskiyou four-o'clock (*Mirabilis greenei*), but could not find them. Other plants of interest found in the RNA include Tracy's pea (*Lathyrus lanzwertii var. tracyi*), Parish nightshade (*Solanum parishii*), and Klamath Basin milkvetch (*Astragalus californicus*). The milkvetch is perhaps the most interesting, since this is the only known Oregon location. Mountain lady's-slipper (*Cypripedium montanum*) is a Northwest Forest Plan Survey and Manage species.

Animals

There have been no large-scale vertebrate surveys done Scotch Creek RNA. However, there are lists for the general area that indicate species that might be expected in the RNA (see for all terrestrial vertebrates Nelson (1997) for Soda Mountain Area and Trail (1999) for birds. Other workers have inventoried the RNA for breeding birds (Alexander 1999), aquatic organisms (Parker 1999) and butterflies (Runquist 1999).

Table 2-30. Scotch Creek RNA Special Status Plants

Scientific Name	Common Name	TNC Rank	Federal Status	ONHP List
Astragalus californicus	California milk-vetch	G4?/SU	--	3
Carex serratodens?	Saw-tooth sedge	G4?/S2	--	2
Cypripedium montanum	Mountain Lady's-slipper	G4G5/S4	--	4
Isopyrum stipitatum	Dwarf isopyrum	G4?/SU	--	3
Microseris laciniata ssp. detlingii	Deling microseris	G4T2/S2	SoC	1
Ribes inerme ssp. klamathense	Klamath gooseberry	G5T3?/SU	--	3
Perideridia howellii	Howell's false-caraway	G4/S3	--	4

Mollusks

Parker (1999) discovered pebblesnails (Hydrobidea *Fuminicola*) in the main channel of Scotch Creek and in the main tributary at T.40S.,R02E.,Sec.01,NE1\4. The snails were at discreet locations in the stream associated with cold water inputs detailed in the Hydrology discussion above. The sites were also associated with flow rates that would prevent the settling of fine sediments on the surfaces of coarse sediments, and where enough sunlight penetrated the canopy to stimulate diatom growth. Parker suggests that the pebblesnails might be localized or endemic species since they have no way to move between streams.

Aquatic Insects

Parker (1999) found that aquatic insect faunas were similar in similar streams. Cool water streams like Scotch and Camp Creeks had many of the same insects. Warm water streams like Skookum Creek and Oregon Gulch Creek shared the same insect fauna.

Terrestrial Insects

Runquist (1999) collected 60 species of butterflies (Appendix P) in the Scotch Creek watershed the summer of 1999. Because of access problems only the northern section of the RNA was sampled. Fifty butterflies were collected in the RNA. An additional 10 species were collected along the decommissioned Scotch connector road from Porcupine Gap to Schoheim road at the north end of the RNA. The remarkable butterfly diversity is a reflection of the geographic location of where ecoregions meet, the diversity of host plants, and the variety of ecological niches.

Amphibians

One remarkable aspect of Parker's survey (1999) was the absence of stream dwelling amphibians in Scotch Creek and Camp Creek and its tributaries, even though suitable habitat (cover, temperature, and flow regimes) seemed to be available. Pacific giant salamander (*Dicamptodon tenebrosus*) and tailed frog (*Ascaphus truei*) are both found in Siskiyou and Cascade mountain ranges, but not in Klamath River Ridges Ecoregion streams. *Dicamptodon* are found in upstream reaches of Jenny Creek, Cottonwood Creek, Emigrant Creek, and Baldy Creek. He suggests that they are absent because the dry south facing slopes are inhospitable for adult stages, or the intermittent or completely dry streams during drought years eliminate aquatic larval habitat.

Fish

Parker (1999) found only rainbow trout (*Onchorynchus mykiss*) in Scotch Creek. Fish were limited to the lower reaches of Scotch and Slide Creek. Fish were absent from the main stem and both forks to about 1.5 km below their confluence. The majority of the Scotch Creek drainage in the RNA is without fish. Trout in Scotch Creek exhibit external morphological characteristics of what is commonly referred to as redband trout.

Birds

Alexander (1999) conducted a breeding bird survey of the RNA in June 1999. Twenty monitoring stations were established. Sixteen were visited twice. A total of 47 species were encountered. Sixteen species are conservation focal species for Oregon and/or California.

Spotted Owls are known to nest in the immediate vicinity of the RNA. Timbered portions of the RNA have been mapped as roosting and foraging habitat using modified McKelvie Spotted Owl habitat criteria.

Grazing

Although Scotch Creek RNA was subjected to heavy grazing pressure in the past, it has seen little use in recent years. If livestock grazing resumes it should be managed within Scotch Creek RNA to promote maintenance of the key characteristics for which the area is recognized.

Transportation

The road system in the watershed adversely affects Scotch and Slide Creeks by contributing sediments, access for ORV abuse, and as a conduit for the spread of weeds. Monitoring the decommissioned Scotch Creek connector for erosion and runoff problems will help determine the need for obliteration. The dirt track (jeep road) from the Schoheim Road down the ridge between the east and west forks of Scotch Creek is contributing excessive sedimentation and should be considered for obliteration.

Recreation

Public uses of RNAs, including recreation, camping, woodcutting, trapping, plant gathering, and OHV use, are generally not compatible with key RNA values unless shown not to hinder achievement of specific plan objectives (Appendix R). Woodcutting, trapping, plant gathering, and OHV use should not be allowed until study show they are compatible.

Except for occasional hikers or horseback riders traveling the length of Scotch Creek the area gets little recreational use. Except for some evidence of OHV damage in the upper southeast boundary from the Schoheim Road, recreational impact is minimal. There may be some road hunting from the Schoheim Road when it is passable in the fall.

Oregon Gulch Research Natural Area

The 1,047 acre Oregon Gulch RNA is located in southeastern Jackson County, Oregon (T.40S.,R.04E., Secs.29, 30 NE1/4NE1/4, 19 S1/2, 20 S1/2SE1/4, 32 N1/2N1/2) along the slopes and bottom of Oregon Gulch in the Jenny Creek Watershed, a part of the Klamath River Drainage (map 2). Oregon Gulch was formed by an intermittent stream informally referred to as Oregon Creek (name not recognized by the Board on Geographic Names)(USDI 1995b). The stream will be referred to as Oregon Gulch Creek here. The RNA begins at Randcore Pass and extends southeast to the BLM's Box-O Ranch. It is located in the eastern portion of the proposed Cascade Siskiyou Ecological Emphasis Area, a special Medford District BLM land designation (USDI 1995a). The RNA is approximately 18 air miles southeast of Ashland, Oregon.

Establishment

The Oregon Gulch RNA was established for scientific research and as a baseline study area for the two Natural Heritage Program cells represented in the area: Rogue Valley mixed conifer and chaparral vegetation (USDI-BLM 1995a).

Oregon Gulch was nominated (USDI-BLM 1989c) as an RNA because it represents two RNA cell needs for: a mixed conifer forest dominated by Douglas-fir and ponderosa pine with large scattered sugar pine and incense cedar also prominent in the over-story, and a manzanita-wedgeleaf ceanothus /bunchgrass chaparral at the eastern boundary of the Klamath River Ridges of the Klamath Mountains Ecoregion. The area was selected for its natural values and its accessability. Several rare species: Greene's mariposa lily (*Calochortus greenei*), Howell's false-caraway (*Perideridia howellii*), and Bellinger meadow-foam (*Limnanthes bellingeriana*) are also found in the area.

RMP Management Restrictions

The Medford District RMP (USDI-BLM 1995a) established the following management requirements on the Oregon Gulch RNA. The RNA is not available for timber harvest and is closed to OHV use and mineral entry. Minerals leasing is subject to no surface occupancy (NSO).

Topography

Oregon Gulch is a northwest/southeast valley formed by Oregon Gulch Creek that lies between between Keene Creek Ridge to the south and the divide between the Oregon Gulch/Rosebud Mountain Ridge and Keene Creek to the north. The RNA is at 4,400 feet elevation at Randcore Pass and 3,240 ft. elevation in the creek bottom at the Box-O Ranch boundary. Elevations along the north ridge line are from 4,466 ft. elev. northeast of Randcore Pass to 4,386 at Rosebud Mountain. Elevations along Keene Creek Ridge to the south range from 4,119 ft. elevation to 4,200 ft. elevation. The lower elevations are characterized open rocky exposures and bench grasslands interspersed with oak/conifer forests. Special topographic features include steep rocky bluffs below Rosebud Helipond, flat, grassy moist benches with decreased drainage between forested areas on the slopes south-facing slopes, and exposed bare scabland hummocks.

Geology

Oregon Gulch RNA is made up of Miocene and Oligocene Western Cascade volcanic, pyroclastic, volcanoclastic, and sedimentary rocks (Map 6). Oregon Gulch is on the south edge fairly complex geological island surrounded by vast areas mapped as Western Cascade Oligocene basalt, basaltic andesite, and andesite (Tb2) on the west and southwest and Pliocene and Upper Miocene basaltic andesite flows (Tba) of the High Cascades Range to the east.

The Western Cascade Oligocene flows are interbedded with volcanic breccias and pyroclastic deposits and other rock types too thin, discontinuous, or poorly exposed to map separately (Smith and others 1985). The Pliocene and Upper Miocene basaltic andesite flow (Tba) commonly is a fine-grained , high-alumina olivine. Except for a few small exposures, Oregon Gulch is separated from the larger, canyon filling flow to the east by Jenny Creek

Four mapped formations are found in Oregon Gulch RNA. With the exception of a slender northeast trending exposure Oligocene intermediate and silicic ash-flow tuff (Ti2, Unit 2) the south half of T40S.,R04E.,Sec.29 is Western Cascade Oligocene basalt, basaltic andesite, and andesite (Tb2). To the north, the RNA is mapped as coarse grained Miocene pyroclastic, volcaniclastic, and sedimentary rocks (Tc4). Between the two units is an east-west band of Miocene and Oligocene salicic ash-flow tuff (Ti3, Unit 3).

The different rock types in these formations are not mapped because of the scale of the map and the complexity of the formations.

Soils

Soil information for Oregon Gulch RNA is based on Soil Survey of Jackson County Area, Oregon (USDA, Soil Conservation Service, 1993)(Map 33). There are eight mapped general soil units in the RNA. Because of the small scale of the map and the large area covered, mapped units are often presented as complexes of different soil types. Number of acres, percent of RNA, productivity class and site index (if any) of the soil types found in the RNA are summarized in table 2-31. About 60 percent of the RNA consist of rock outcrop soil complexes. The balance (40 percent) are soil types capable of supporting mixed conifer stands.

Hydrology

Oregon Gulch represents about 10.5 percent of the Lower Jenny Creek Subwatershed. About 60 percent of Oregon Gulch is in the transient snow zone (USDI 1995b). Oregon Gulch Creek has its headwaters in the wetlands at Randcore Pass just outside the

Table 2-31. Oregon Gulch RNA Soil Units (USDA 1993)

Unit #	Unit Name	Percent Slope	Acres	Percent Acres	Productivity Class *	Site Index **
19E	Bybee-Tatouche complex	12 to 35	6	0.58	PSME*** 8, 8	85, 90
113E	McMullin-Rock outcrop complex	3 to 35	78	7.48	-	-
113G	McMullin-Rock outcrop complex	35 to 60	46	4.4 1	-	-
114E	McNull loam, south slopes	12 to 35	310	29.72	PSME 7	80
115E	McNull gravelly loam, south slopes	12 to 35	9	0.86	PSME 6	70
116E	McNull-McMullin gravelly loam, south slopes	12 to 35	48	4.60	PSME 6	70
116G	McNull-McMullin gravelly loam, south slopes	35 to 60	17	1.63	PSME 6	70
117G	McNull-McMullin complex, north slopes	35 to 60	13	1.25	PSME 7	80
119F	McNull-Medco complex	1 to 12	9	.86	PSME 7	70, 65
170C	Skookum very cobbly loam	1 - 20	2	.19	-	-
173D	Skookum-Rock outcrop-McMullin complex,	1 to 20	40	3.84	-	-
173F	Skookum-Rock outcrop-McMullin complex	20 to 50	465	44.58	-	-

*Site Index. Height and age of selected trees in stands of a given species. A designation of the quality of a forest site based on the height of the dominate stand at an arbitrarily chosen age. Average height at 50 yrs = 75 feet. SI is 75. Age varies with species and soil type: 100 yrs. PSME on Pokegama and Woodcock units, PIPO all units; 50 yrs. PSME on all other units, ABMASH, and ABCO. ** Productivity Class. Yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands. ***PSME = *Pseudotsuga menziesii*, Douglas-fir.

established RNA boundary. Water is contributed to the stream from springs and seeps along its course. There are two unnamed springs marked on USGS 7.5 Soda Mountain Quad. and one, below Rosebud Mountain (42.03.58W, 122.22.25N), on the Parker Mountain Quad. Of the two springs in the Soda Mountain Quad, one (42.04.09N, 122.23.53W) is just out side the RNA boundary to the southwest. The other spring (42.03.57N, 122.22.36W) is just below the Rosebud Helipond. Rosebud Spring just north of the Rosebud Helipond on the south-facing slopes of the Oregon Gulch/Keene Creek ridge is not mapped. Another spring and seep is associated with livestock water developments (see below).

The is little data concerning stream flows and temperature. Oregon Gulch Creek is an intermittent stream that dries up as early as mid May or not until July, but typically by the second week of June, depending on the distribution and amount of rain in any given year. Parker (1999) and Miller (1999) both report small pools of water in Oregon Gulch Creek in the summer of 1999. Miller (1999) attributes this to out flow from Rosebud Helipond and the impervious basalt sheets that form the stream bed where the pools are found.

Water temperature data were collected in late June and early July, 1998 (an unusually high water year) at two sites in Oregon Gulch Creek, at the Box-O Ranch/RNA border (17 days) and downstream near the Jenny Creek junction (14 days). At the Box-O Ranch west boundary site the 7-day average daily temperature was 76.8° F (max 80.1° F - min 58.2° F). At Jenny Creek site 7-day average daily temperature was 76.0° F (max 77.9° F - min 52.8° F).

Stream condition and stability is fair due to excessive road culvert failures (1995b).

Vegetation

Miller (1999) recognized five major plant communities were by in her mid-summer vegetation reconnaissance of Oregon Gulch RNA (map 34):

- Western Juniper/Garry Oak scrubland
- Garry Oak/Wedgeleaf ceanothus grass or scrubland
- Garry Oak/Ponderosa Pine forest
- Mixed Conifer/California Black Oak forest
- Riparian

Riparian species were found along Oregon Gulch Creek and some of the tributaries. Miller did not describe the manzanita-wedgeleaf ceanothus /bunchgrass chaparral community described in the nomination document (USDI-BLM 1989c). Manzanita is not present on her brief species list.

Western Juniper/Garry Oak scrubland

This community is found on the driest sites. Western juniper is the dominate tree with a few ponderosa pine and Garry oak. Tree coverage is less than 10 percent. Shrub cover varied between 15 to 60 percent with considerable bare rock. Rabbitbrush (*Chrysothamnus nauseous*) was the most significant shrub, although wedgeleaf ceanothus (*Ceanothus nauseous*) may dominate in some areas. The herbaceous layer is sparse, dominated by annual grasses [medusa-head rye, (*Taeniatherum caput-medusa*); nodding brome, (*Bromus tectorum*)] and the perennial alien grass, bulbous bluegrass (*Poa bulbosa*). Forbs include scattered wild buckwheats (*Eriogonum spp.*) and biscuitroots (*Lomatium spp.*).

Garry Oak/Wedgeleaf ceanothus grass or scrubland

The balance between Garry oak and wedgeleaf ceanothus cover varied widely in this community in a mosaic that include relatively flat wet meadows. Miller (1999) found the community covered wide stretches of land following a more or less homogenous slope and aspect. Garry oak frequently formed a dense canopy with few other tree species, although occasional ponderosa pine, western juniper, California black oak, and Douglas-fir are scattered in the community. The percent cover of shrubs is usually greater than the tree coverage. The shrub layer often consists of Garry oak sprouted from the base of older trees although wedgeleaf ceanothus is usually dominates. other shrubs, serviceberry (*Amelanchier alnifolia*), mountain mahogany(*Cercocarpus betuloides*), and hazelnut (*Corylus cornuta* var. *californica*) are common. Grasses include the nearly ubiquitous bulbous bluegrass (*Poa bulbosa*) and medusahead (*Taeniatherium caput-medusae*) and natives such as, Idaho, western and California fescue (*Festuca idahoensis, F. occidentalis, F. californica*), and California oatgrass (*Danthonia californica*). Forbs varied from relative xeric species associated with the oaks and wedgeleaf ceanothus (balsam-root, *Balsamorhiza deltoidea*; wooly sunflower, *Eriophyllum lanatum*; *Lomatium macrocarpum*) or wet meadow (heal-all, *Prunella vulgaris*; death camas, *Zigadenus venenosus*).

Garry Oak/Ponderosa Pine forest

This community consists primarily of Garry oak with greater diversity of conifers, particularly ponderosa pine than the tree composition in the Garry oak/wedgeleaf ceanothus community. Other common conifers include Douglas-fir, incense cedar, and sugar pine. Shrubs include wedgeleaf ceanothus, tall oregon-grape (*Berberis aquifolium*), mountain mahogany (*Cercocarpus betuloides*), snowberry (*Symphoricarpos mollis*) and serviceberry (*Amelanchier alnifolia*). Grasses include aliens; bulbous bluegrass (*Poa bulbosa*), medusa-head rye (*Taeniatherium caput-medusae*), and hedgehog dogtail (*Cynosurus echinatus*); and natives; Idaho fescue (*Festuca idahoensis*), California oatgrass (*Danthonia californica*). Forbs include larkspur (*Delphinium menziesii*), strawberry (*Fragaria vesca*), arnica (*Arnica latifolia*), sweet-cicely (*Osmorhiza chilensis*), and yarrow (*Achillea millefolium*).

Mixed Conifer/California Black Oak Forest

Conifers dominate that tree layer in this community. They include Douglas-fir, ponderosa pine, incense cedar, and sugar pine. There is very little white fir. Both oaks are also present. Garry oak is present around the margins and in openings. California black oak is found among the conifers but is overtopped by them. The large, old, decadent California black oaks appear to be remnants of a different looking, much more open community. Shrubs include snowberry (*Symphoricarpos albus*), tall Oregon-grape (*Berberis aquifolium*), serviceberry (*Amelanchier alnifolia*), mountain mahogany (*Cercocarpus betuloides*), oceanspray (*Holodiscus discolor*), little woodrose (*Rosa gymnocarpa*), and deerbrush (*Ceanothus integerrimus*). There are few grasses in the forested areas except for bulbous bluegrass (*Poa bulbosa*), and California fescue (*Festuca californica*). Medusa-head rye (*Taeniatherium caput-medusae*), hedgehog dogtail (*Cynosurus echinatus*), Idaho fescue (*Festuca idahoensis*), and California oatgrass (*Danthonia californica*) occur in or near openings. Forbs include pathfinder plant (*Adenocaulon bicolor*), strawberry (*Fragaria vesca*), arnica (*Arnica latifolia*), sweet-cicely (*Osmorhiza chilensis*), rattlesnake orchid (*Goodyear oblongifolia*) and Scouler harebell (*Campanula scouleri*).

Riparian

Riparian vegetation is confined to Oregon Gulch Creek, its sometimes steep narrow canyon and tributaries. Trees are Oregon ash (*Fraxinus latifolia*), willows (*Salix spp.*), and Douglas hawthorn (*Crataegus douglasii*). Shrubs include chokecherry (*Prunus virginiana*), Douglas spiraea (*Spiraea douglasii*) and deerbrush (*Ceanothus integerrimus*) stands on shady banks near the stream. There are a number of herbaceous species: horsetail (*Equisetum arvense*), Sedges (*Carex spp.*), cattail (*Typha latifolia*), yellow monkeyflower (*Mimulus guttatus*), Howell's false-caraway (*Perideridia howellii*), and Bellinger meadowfoam (*Limnanthes bellingeriana*).

Alien plants

With exception of grasses such as bulbous bluegrass (*Poa bulbosa*), medusa-head rye (*Taeniatherium caput-medusae*), hedgehog dogtail (*Cynosurus echinatus*), and nodding brome (*Bromus tectorum*) the RNA is relatively free of invasive noxious weeds. Miller (1999) mentions *Alyssum alyssoides*, bull thistle (*Cirsium vulgare*), and dyers woad (*Isatis tinctoria*), among others. She apparently did not find starthistle (*Centaurea solstitialis*) since she writes "presumably eradicated" in her Appendix I. She only lists dyers woad and does not mention it in the text nor on her data sheets. Of these medusa-head rye is the most wide-spread.

Special plants

Two Bureau Sensitive Species (BSO) are found in the RNA: Bellinger meadowfoam (*Perideridia bellingeriana*) and Greene's Mariposa lily (*Calochortus greenei*). Bellinger meadowfoam is found in a vernal tributary stream at a single location. Greene's Mariposa lily grows in open Garry oak thickets with deep high clay content soils south of Oregon Gulch creek and into the Box-O Ranch. According to the Oregon Natural Heritage Program (1996) these two species are Federal Species of Concern and ONHP Category 1. It is Bureau policy to protect, manage and conserve BSO species and their habitats on lands administered by the BLM in such away that any bureau action will not contribute to the need to list these species.

Howell's false-caraway (*Perideridia howellii*) is a Bureau Watch Species (BWO). It is most common in and along the upper reaches of Oregon Gulch Creek. This species is OHNP Category 4. Species in this category currently appear to be stable, but may become threatened in the foreseeable future.

Forest Health

The mixed conifer forest stands in Oregon Gulch RNA have a large mature sugar pine component that was previously open grown. Some scattered incense cedar and ponderosa pine are found as well. Average age of these trees is estimated to exceed 250 years. Most of the stand is composed of younger co-dominant and suppressed Douglas-fir that originated after the last fire event approximately 100 years ago. A few white fir are also found in the understory. The Douglas-fir is currently overstocked and competing directly with the sugar pine and other dominant tree species for water and nutrients. Sugar pine are being attacked by mountain pine beetle *Dendroctonus ponderosa* and red turpentine beetle *Dendroctonus valens* due to overstocking and low vigor. Average decadal growth rates for sugar pine in these stands is well below the 1.5 inch diameter growth needed to maintain tree vigor at a level considered necessary to pitch out bark beetles. The stand is currently carrying over 220 square feet of basal area which is well above the 150 feet level preferred for pine. The rate of sugar pine mortality has increased in the area during the last ten years. Most of the mortality occurred in 1995 during a localized mountain pine beetle outbreak.

Animals

There have been no large-scale vertebrate surveys done Oregon Gulch RNA. However, there are lists for the general area that indicate species that might be expected in the RNA (see for all terrestrial vertebrates Nelson (1997) for Soda Mountain Area and Appendix 10 (USDI-BLM 1995b) for the Jenny Creek Watershed; St. John (1984) for herps and reptiles, and Trail (1999) for birds. Other workers have inventoried the RNA for breeding birds (Alexander 1999), aquatic organisms (Parker 1999) and butterflies (Runquist 1999).

Mollusks

Parker (1999) found the gastropod *Stagnicola* (Lymnaeidae) in the main channel and the Rosebud tributary and in the upstream meadow. *Physella* (Physidea) was present in sunlit stream pools in the lower reaches of Oregon Gulch Creek. The springs in the RNA apparently do not support populations of pebblesnails.

Insects

Runquist (1999) collected 43 species of butterflies (Appendix P) in the RNA the summer of 1999. The relatively high species count is a direct reflection ecological diversity of the RNA and the number and kind of plant communities upon which the butterflies rely for larval host plants and adult nectar sources. The wet meadow just to the southeast of Randcore Pass add another seven species for a total of 50. Runquist noticed the sudden disappearance several butterfly species in mid-July that correlated with the appearance of cattle in the wet meadow at the upper end of the RNA below the Randcore Pass road just outside the RNA boundary. He attributed this to trampling of vegetation and cattle consuming flowers that had been used by butterflies.

Amphibians

Parker (1999) observed Pacific treefrog (*Pseudacris regilla*) and rough-skinned newts (*Taricha granulosa*) in the headwater meadow and among pools along Oregon Gulch Creek. Rough skinned newts have also been seen in the stockpond/pump chance near the decommissioned road along the north facing slopes of the RNA toward the Box-O Ranch. The treefrog tadpoles and metamorphs were observed in the isolated pools. It was the only breeding population of either species observed in the survey area that did not occur in artificial impoundments.

Fish

Parker (1999) did not find any fish in Oregon Gulch Creek in his summer survey. He felt that rainbow trout (*Oncorhynchus mykiss*), Klamath small-scale suckers (*Catostomus rimiculus*) and speckled dace (*Rhinicthys oscularus*) might be move from Jenny Creek as transients during periods of high flow.

Redband trout fry in 85° F water have been observed in Oregon Gulch Creek from the mouth to an obstruction about 1 mile or more upstream (Tim Moffat, Dave Squyers, Jane Lefors, pers. comm.). Apparently adults spawn during high water then return to Jenny Creek. Some fry probably return to Jenny Creek, others perish: eaten by raccoons or dry up with the pools as the season progresses. Their survival at high temperature is testimony to the temperature tolerance attributed to redband trout.

Birds

Alexander (1999) conducted a breeding bird survey of the RNA in June 1999. Seventeen monitoring stations were established. Sixteen were visited twice. A total of 42 species were encountered. Thirteen species are conservation focal species for Oregon and/or California.

The area has been surveyed for Great Gray Owls and Spotted Owls. Great Gray owls are apparently not found in the RNA. Spotted Owls are known to nest in the RNA (BLM surveys). Timbered portions of the RNA have been mapped as roosting and foraging habitat using modified McKelvie Spotted Owl habitat criteria.

Grazing

Livestock grazing should be managed within RNAs to promote maintenance of the key characteristics for which the area is recognized (Appendix R). Oregon Gulch RNA is also known as Oregon Gulch Pasture and is a part of the Ashland Resource Area grazing plan.

As previously noted, cattle may have impacted butterfly populations in the wet meadow that supplies water to Oregon Gulch Creek. There have been no studies in Oregon Gulch RNA to monitor or establish the effect of grazing on the watershed, the ecosystem, or the sensitive plants.

Transportation

Oregon Gulch RNA is unusual for an RNA in that pre-existing roads transverse the area. Lincoln Creek BLM Road 40-3E-12.1 passes over Randcore Pass then inside the southwest boundary of the RNA. The road is rocked for much of its length and is subject to occasional culvert failure. Road 40-3E-12.2 transverses the RNA for a short distance in the southwest corner of the RNA and travels south through public and private land to Agate Flat. The natural surfaced road to Rosebud Helipond and private land and BLM land north of Rosebud (40-3E-19.0 and -19.1) is built on clay soil that is prone to rutting and erosion in wet weather. Both roads probably contribute to the excessive road culvert failures and contribute to the fair rating for stream condition and stability mentioned in the hydrology discussion above.

Recreation

Public uses of RNAs, including recreation, camping, woodcutting, trapping, plant gathering, and OHV use, are generally not compatible with key RNA values unless shown not to hinder achievement of specific plan objectives USDI-BLM 1987). Woodcutting, trapping, plant gathering, and OHV use should not be allowed.

The RNA gets seasonal use by hunters. The large flat area at Randcore Pass is used as a fall hunting camp. Problems associated with camping include trash, garbage and human sanitation. These temporary camps do not appear to be incompatible with values for which Oregon Gulch RNA was established. There is some evidence of OHV use on the decommissioned road east from BLM 40-3E-12.1 to the Box-O Ranch. Vehicles are able to pass through or around barricades. Other recreational use includes causal recreational driving along existing roads when passable (and sometimes when not passable), horseback riding, and nature study.

Jenny Creek Area of Critical Environmental Concern

The Jenny Creek ACEC in the CSEEA is located in south-eastern Jackson County, Oregon and far north-central Siskiyou County in California (Map 2) along fourteen, narrow, widely separated, non-contiguous portions of Jenny Creek and its tributaries: Johnson Creek, Corral Creek, Beaver Creek, Keene Creek from a mile west of Johnson Prairie on Jenny Creek at T39S.,R.04E.,Sec.15, NE 9(Willamette meridian)to T.48N.,R05W.,Sec.24 (Mt.Diablo meridian) at Jenny Creek Falls just south of the Oregon/ California Border. BLM proposes to include a 2.5 mile segment of Jenny Creek on the Box-O Ranch into the Jenny Creek ACEC. Elevation varies from 3,770 feet at the northern most segment to 2,690 feet below the Jenny Creek Falls segment in California. The segments vary in width from approximately 0.4 mi or less and length from nearly 2 miles to as short as 0.2 mi, depending on topography and ownership. The ACEC in the CSEEA encompasses 1,600 acres of the watershed's 134,300 acres. The proposed inclusion of the riparian reserve on the Box-O Ranch into the Jenny Creek ACEC will add approximately 280 acres to this allocation.

Existing conditions in Jenny Creek are influenced by conditions on private and public lands. The BLM can carry out water quality improvement projects on land under its control. The BLM has little or no control over activities on private land. Following is an analysis of existing conditions that is the result of the interaction of private and public activities.

Establishment

The Jenny Creek ACEC is intended for overall resource protection, maintenance, and level of public use intended by the Bureau and the public (USDI-BLM 1989a). The primary ACEC objective is to provide protection for Jenny Creek's natural systems, riparian values, special status fish, and other special status plants and animals (USDI-BLM 1995a). The protection provided by the ACEC designation will help bring Jenny Creek to the standards established by the aquatic conservation strategy required by the Northwest Forest Plan. Activities in the ACEC must maintain or enhance natural systems and processes.

RMP Management Restrictions

The Medford District RMP (USDI-BLM 1995a) established the following management requirements on the Jenny Creek ACEC. The ACEC is not available for timber harvest and is closed to OHV use and mineral entry. Minerals leasing is subject to no surface occupancy (NSO).

Geology

Jenny Creek generally flows through steep-sided canyons bordered by basaltic andesite Pliocene and Upper Miocene volcanic rocks of the High Cascade Range on the east and various Miocene and Oligocene volcanic and sedimentary rocks of older Western Cascade Range to the west (Map 6). Most segments of the Jenny Creek ACEC in the RMP CSEEA (Alt .A) are found along Jenny Creek. Alternative D proposes expansion of the ACEC to include land other than that immediately adjacent Jenny Creek.

Soils

Soils identified on the 219 acres of the Lower Jenny Box-O and Lower Jenny Crossing ACEC segments (included in the RMP) are Skookum-Rock outcrop-McMullin (47%), Skookum-Rock outcrop- Rubble land complex (23%), Skookum very cobbly loam (15%), Greystoke-Pinehurst complex (9%), Campfour-Paragon complex (4%), and Randcore-Shoat complex (2%). The Skookum and Randcore-Shoat soils are best used for wildlife habitat. The utility of these soils for grazing is limited by topography and soil characteristics. (SCS 1993). The Greystoke-Pinehurst and Campfour-Paragon complexes are suited for timber production, grazing and wildlife habitat. See general soils map 10 for location of the soils on the landscape.

Vegetation

Vegetation consists of typical mid elevation riparian plants along the stream. Most of the 11 segments are dominated by white alder, Oregon ash, black cottonwood, quaking aspen, Douglas hawthorn and bigleaf maple. Shrubs include shining and arroyo willows, Douglas spirea, and mock-orange. Stream-side graminoids include several dominate Carex species found along the stream margin and as hummocks emerging in the stream channel, cattail, bulrush, and grasses, including meadow barley, timothy, blue wildrye, and water foxtail. Common submerged aquatic vascular plants include waterweed, pondweeds, and smartweed in slow water areas. Location and density of riparian vegetation depends on elevation of segments, stream characteristics (riffle or reach), and stream bank characteristics (flat or steep canyon).

Alien Aquatic Plants

At the present time common pondweed (*Elodea canadensis*) and crispate-leaved pondweed (*Potamogeton crispus*) are present in slower moving reaches of Jenny Creek. Both species were probably accidentally introduced from Howard Prairie and Hyatt reservoirs. Both pondweeds frequently form dense mats that cover the stream bottom interfering with normal energy flows and food sources.

Purple loosestrife (*Lythrum salicaria*), a noxious emergent aquatic weed, is not been found in the Jenny Creek watershed. Because it has been cultivated as an ornamental, the plant could be accidentally introduced into the watershed from water-gardens or ponds associated with homes in the Lincoln/Pinehurst area or introduced by waterbirds or other biotic vectors from populations elsewhere.

Alien Terrestrial Plants

Alien terrestrial plants are found in the ACEC segments at the edge of the riparian zone and beyond. Annual grasses (medusa-head, hedgehog-dogtail, nodding brome) are common in dry places. Starthistle is well established in grazed areas, particularly along the Box-O Ranch segment. Dyer's woad has been found along roads on the Box-O Ranch.

Aquatic Animals

Jenny Creek forms of redband trout (*Oncorhynchus mykiss*) and dwarf form of Klamath small-scale sucker (*Catostomus rimiculus*) are isolated from others of their kind by Jenny Creek Falls in California. The 60 foot drop prevents upstream movement by fish, thus isolating Jenny Creek Fish. Speckled dace (*Rhinicthys oscularus*) is a third native species found in Jenny Creek and its tributaries. These organisms are of biological interest because they represent isolated revolutionarily significant units that have differentiated morphologically or genetically.

Other vertebrate animals of note are populations of western pond turtles (*Clemmys marmorata*) found at several locations along the stream both in and out of the ACEC and yellow-legged frogs (*Rana boylei*) have been observed in the Corral Creek portion of the ACEC. The introduced bullfrog(*Rana catesbeiana*) has been noted along ponded areas of the stream.

Aquatic mollusks that include nine undescribed species of pebblesnails of Frest and Johnannes (1999) and the scalloped juga (*Juga acutifilosa*) snail are found in nearby springs. A dwarf form of the fresh water western pearlshell mussel (*Margaritifera falcata*) that may be an undescribed variety occurs middle and lower Jenny Creek. Two terrestrial mollusks, a slug [Klamath tail-dropper, (*Prophysaon dubium*)], associated with wet meadows, and a snail [Siskiyou hesperain, (*Vespericola sierranus*)] are also associated with nearby springs and wet areas.

Fish population (redband trout, dwarfed Klamath small scale suckers, speckled dace) status is unknown. Western pond turtle populations may be at risk because of lack of coarse woody debris in the streams, nest trampling by livestock, and predation on young by introduced bullfrogs. Endemic mollusks are not known from Jenny Creek in

ACEC segments although found in springs associated with Spring Creek and School House Meadow and at Fredenburg Springs. At risk in known locations on private land from livestock trampling at unprotected springs.

Introduced organisms – Fish

Three exotic fish have been reported in Jenny Creek. Brown bullheads (*Ictalurus nebulosus*) and golden shiner (*Notemigonus crysoleucas*) are introduced fish that escape into Jenny Creeks and Keene Creek from Hyatt and Howard Prairie Reservoirs. Their survival, distribution, and effect on the Jenny Creek Ecosystem are not known. Since they are present in very low numbers (J Rossa, Medford, per comm 1999) their impact probably is not great. Above the Jenny Creek Falls coastal rainbow trout (*Onchorynchus mykiss*, the source of hatchery strains, as shown by the presence of alleles (genes) in tested fish) can be considered an exotic fish. The coastal rainbow were introduced into the stream environment accidentally as escapes from Howard Prairie or Hyatt reservoirs, or were purposely planted by the Oregon Department of Fish and Wildlife. Oregon Department of Fish and Wildlife ceased plant hatchery rainbows in Jenny Creek in the late 1960s.

Introduced organisms – Amphibians

Bullfrogs are established in Jenny Creek and are known to eat baby western pond turtles (St. John 1984). Bullfrogs are active carnivores that consume a large array of organisms from aquatic insects to crawfish and baby ducks. They undoubtably alter energy flows and food webs.

Wildlife

Introduced organisms – Animals

Introduced aquatic animals have the most direct impact on the Jenny Creek ecosystem. Introduced terrestrial animals, with the exception of domestic livestock, have had no recognized direct impact on Jenny Creek ACEC or the values for which it was established. Introductions include wild turkeys and starlings. Virginia opossum has not been reported from the area. Establishment of feral pig populations (escapes or releases from farms and ranches near Lincoln) could become a problem.

Hydrology

Over all watershed function is at risk with an upward improving trend. Areas of concern are high stream temperatures, sediments from erosion from roads, grazing, timber harvest, low stream flow from water diversions. ACEC segments of Jenny Creek are responding to exclusion of livestock, cessation of timber harvest, and enhancement projects.

- Riparian vegetation is increasing in structure and diversity with controlled cattle grazing.
- Stream banks are stabilizing in ACEC segments with controlled cattle grazing.

Incised channels prevent high water flows from accessing flood plains where they would deposit sediment and coarse woody debris. Private stream stretches are at risk from grazing, logging, water diversion, and channelization. All segments are at risk from beaver loss and stream flow diversions by Talent Irrigation District, Pacficorp, and local ranches and residents.

Recreation

Fishing is popular throughout the ACEC for trout. The impact on redband trout populations is not know. Small groups have been observed camping on the west bank of Jenny Creek below the ford. Anticipated problems include trash, garbage, and human sanitation.

Transportation

No major roads directly effect ACEC segments except BLM Road 39-4E-5 above bridge where Bluejay Springs Creek enters Jenny Creek. The road runs directly beside the creek for about 1,600 feet and forms the east boundary of that ACEC segment. Other direct contact with Jenny Creek at ACEC segments are at fords and bridges. Ford crossings at Johnson Creek, Keene Creek, Box-O Ranch(4), and Lower Crossing contribute negligible amounts of petroleum products to the stream and disturb bottom sediments. Run-off from bridge surfaces at Highway 66, Jenny Creek near confluence with Johnson Creek, Jenny Creek below Bluejay Springs also add small amounts of petroleum. Roads within the watershed alter natural down slope hydrology and contribute sediments from road surfaces, banks, and fills directly in runoff, or as road dust that drifts directly into the stream or onto roadside surfaces that later are flushed into the stream by precipitation events.

Pilot Rock Area of Critical Environmental Concern

Pilot Rock is a prominent 5,908 foot geological feature in southern Oregon reminiscent of Devil's Tower and Devil's Postpile National Monuments. Pilot Rock is visible from much of the Shasta Valley in northern California and parts the Bear Creek Valley in southern Oregon. The Rock stands just to the southeast of Siskiyou Pass, the lowest and simplest way to travel between the Rogue and Klamath watersheds. Pilot Rock has been a guide to travelers over the Siskiyou Mountains since humans first traveled through the country to the present day. Native Americans, Hudson's Bay Company fur brigades, and early exploring expeditions traveled over Siskiyou Pass on what became known as the Siskiyou Trail. Later it became the Oregon/ California Wagon Road and established a north-south route for commerce and travel in pioneer days. Still later the pass, via a tunnel became the route of the Southern Pacific Railroad. As time continued the roads were relocated and improved with the development and construction of U.S. 99 and finally U.S. Interstate Highway 5 (I-5).

Pilot Rock ACEC (544 acres) is located in south central Jackson County, Oregon in two parcels within two miles of the Oregon/California border east and west of Interstate 5. The Pilot Rock Unit (321 acres) is1.6 mi north of the Oregon/California border and 2.2 mi east of I-5 in T.41S.,R.02E.,Secs.02, 03 (Willamette meridian). The Mariposa Unit (222.77 acres) is 0.4 mi north of the Oregon/California border adjacent to I-5 at Exit 1 in T.41S.,R.02E.,Sec.08 (Willamette meridian) .

The boundary of the Pilot Rock Unit (map 2) follows the 5,100 ft contour around Pilot Rock with an extension to the southwest into the SE1/4 of Section 02,T.41S.,R02E. The eastern boundary extends into private land as mapped in the ACEC nomination document (the 5,100 ft. contour around the Rock) and Map 8 of the Medford District RMP. The boundary on both maps does not include the fossil locality mentioned in the RMP (USDI-BLM 1995a, Table 6, page 60), presumably because it had not been determined that the fossils had any scientific merit.

The Mariposa Unit was added to the Pilot Rock ACEC in the 1995 Medford District RMP as shown on Map 8 of RMP. The Mariposa Unit was acquired November 5, 1993. The Medford District RMP indicates that the aquisition was added to the Pilot Rock ACEC in

1995 for the following reason. The total Pilot Rock ACEC area of 544 acres (USDI-BLM 1995, Table 6, page 60) is equal to the sum of the original 321.23 acre area (Pilot Rock Unit) with the extension, plus the Mariposa Unit area (222.77 acres). The correct size of the Mariposa Unit is 222.77 acres, not 220.77 or 223 as sometimes published.

Vehicle access to the Pilot Rock Unit is via the rock surfaced Pilot Rock road 40-2E-33 and 41-2E-3.0 to the parking lot at the saddle west of Pilot Rock. BLM road 41-2E-3.0 from the southwest is closed to vehicles, but provides a 2.7 mi hiking route to the saddle parking lot. One and a half miles the Pacific Crest National Scenic Trail crosses through the northern portion of the ACEC. Roads are often closed by snow during the winter and early spring.

Establishment

Pilot Rock ACEC Pilot Rock Unit was originally established for its scenic, historic, cultural values; its wildlife resources, and geological and botanical natural systems. The Pilot Rock ACEC Mariposa Unit (also known as the Mariposa Botanical Area or the Mariposa Lily Preserve) was added because of its rare plants and as winter deer range.

RMP Management Restrictions

The Medford District RMP (USDI-BLM 1995a) established the following management requirements on the Pilot Rock ACEC. The Pilot Rock ACEC Unit is not available for timber harvest and is closed to OHV use and mineral entry. Minerals leasing is subject to no surface occupancy (NSO). The Mariposa ACEC Unit is not available for timber harvest and is closed to OHV use. The BLM does not have mineral interests in the area.

Topography

Pilot Rock Unit. Pilot Rock (5,908 ft. elev) dominates this part of the Pilot Rock ACEC. It is the remains of an ancient volcanic plug that rises 800 feet above the surrounding landscape. Pilot Rock stands on the divide of three different watersheds: Scotch Creek to the east; Bear Creek (Emigrant Creek) to the north; Cottonwood Creek to the south (Hutton Creek) and west (Bear Gulch and unnamed Cottonwood Creek tributaries). Pilot Rock gives way to saddles to the east and west. The saddle to the east consists of an open rocky area with a clear view of the northeast face of Pilot Rock. Across the saddle to the west is a forested hill (5,401 ft. elev). To the north, Pilot Rock drops steeply into the forested headwaters of Emigrant Creek. To the south and east the ridges and cliffs below the Rock divide the drainages of Scotch and Hutton Creeks with a mosaic of rock outcrops and conifer forests. Much of the lower slope of Pilot Rock is covered by conifers. However, the lower slope of the Rock is open and exposed to the southwest. South from the forested saddle to west, a wet meadow with two stock pond form the headwaters of Hutton Creek. Across from the meadow below the open lower southwest slopes of the Rock, a broad, open rocky band extends west and north around the forested hill to the west of Pilot Rock.

Mariposa Unit. This unit consists of open relatively gentle westerly slopes that drop to two intermittent tributary streams of Cottonwood Creek. One stream forms a valley with an open meadow along the northern border from east to west. Bestland (1987) refers to this tributary of Bear Gulch as Chocolate Falls Creek. The north slopes are steeper than the relatively gentle south-facing slopes. The other stream starts near the southern boundary and flows to the southwest through a short relatively steep sided valley. Elevations vary from a high point of slightly more than 3,560 ft. elevation at Exit 1 on just to the west of Interstate 5 and at the far western border to lows of 3,400 ft. elevation at the southern ACEC boundary at the head of the south flowing stream and 3,310 ft. elevation at the western ACEC boundary and Chocolate Falls Creek.

Geology

Pilot Rock Unit. Pilot Rock and vicinity is primarily Oligocene Western Cascade volcanic, pyroclastic, volcanoclastic, and sedimentary rocks (Map 6) on the western edge of the Western Cascade Geological Province. Much of the area is mapped as Western Cascade Oligocene basalt, basaltic andesite, and andesite (Tb2) by Smith and others (1982) and is considered part of the Roxy formation (Bestland 1987). These Western Cascade Oligocene flows are interbedded with volcanic breccias and pyroclastic deposits and other rock types too thin, discontinuous, or poorly exposed to map separately (Smith and others 1982). To the southwest and below are three long narrow exposures: the upper, of coarse grained facies of pyroclastic, volcanic, and sedimentary origin (Tc2); the middle bond consists of intermediate and silicic ash-flow tuffs (Ti2); the lower is mapped as Tb2. To the southwest below the coarse grained rocks (Tc2) is an extensive Holocene landslide deposit (Ql). The most significant geological feature is Pilot Rock itself, an Oligocene mafic intrusive volcanic plug (Tm). Its tall, jointed columnar basalt cliffs stand in marked contrast to the surrounding landscape. Purdom (n.d.) described the formation of the volcanic plug and the geology of the Pilot Rock vicinity.

The presence of Oligocene fossil plants embedded in volcanic ash bed was one of the reasons for the establishment of the Pilot Rock ACEC (USDI-BLM 1988). The fossils include leaf impressions and conifer cones that are 25 to 35 million years old. Fossils include the dawn redwood (*Metasequoia*), maples, sycamore, and katsura (*Ceridiphyllum*) trees that indicate a warm temperate flora at the time.

It was recommended that the fossil not be included in the ACEC until a determination could be made of the scientific value of the site. In the Medford District RMP (1995a), "fossils" is listed (Table 6, page 60) as one of the values of the Pilot Rock ACEC. The fossils mentioned in the nomination document are located in a road cut along the old Pilot Rock Rd. (41-2E-9) at T.41S.,R.02E.,Sec.09SE1/4NE1/4 (42.01.12.34/ 122.35.02.11). Subsequently, another fossil exposure was located along the Schoheim Road (40-2E-10.1) at T.41S.,R.02E., Sec.10,SW1/4NW1/4 (42.01.5.0/122.31.27.430). Both are outside the boundaries shown on Map 8 of the 1995 RMP .

In1998, a road barrier (pit) was constructed in the middle of the 41-2E-9 locality exposing more fossils. This locality has been visited by botany and natural history classes from Southern Oregon University in the past. Carefully exposed fossil bearing rocks at both localities indicate recent excavation.

Mariposa Unit. Bestland (1987) mapped much the Colestine-Siskiyou Summit area of the Cottonwood Valley, including the Mariposa Unit. A small part of the northeast section below Interstate 5 is mapped as volcanic breccia and epiclastic sandstone (Tc). Below and occupying most of the unit is an area composed of basaltic andesite lava flows (Tclb). The valley bottom of the northern transverse stream and a sliver in the southwest corner is mapped as Chocolate Falls tuff (Tcft) composed of welded crystal and lithic tuff. There is a small Quaternary landslide deposit on western border of the Unit.

Member Tc is an undifferentiated, poorly consolidated, collection of volcanic materials that resembles Quaternary colluvium or landslide debris. Member Tclb lava flows cap most of ridges and form dip slopes in the area and interbeds with the upper Chocolate Falls tuffs. Member Tcft consists mostly of pumice tuffs and lapilli. The dark-gray mineral vitrophyre may resemble obsidian where well developed.

Soils

Soil information for Pilot Rock ACEC is based on Soil Survey of Jackson County Area, Oregon (USDA, Soil Conservation Service, 1993). Because of the small scale of the map and the large area covered, mapped units are often presented as complexes of different soil types.

Pilot Rock Unit. There are nine mapped soil units in the Pilot Rock Unit (table 2-32, map 35). Number of acres, percent of Pilot Rock Unit ACEC, productivity class and site index (if any) of the soil types found in the RNA are summarized in table 2-30. About 30 percent of the Pilot Rock Unit consists of rock outcrop complex that will not support large conifer stands. Seventy (70) percent are soil types capable of supporting mixed conifer and white fir stands.

Mariposa Unit. There are six mapped soil units (table 2-33, map 36). McNull loam is the only soil capable of supporting a conifer/hardwood community in the Mariposa Unit. It represents 0.1 (0.1 acres) percent of the area in the unit. The majority of the area consists of soils composed of Carney shrink-swell clays that form deep cracks in the summer. On steeper slopes erosion becomes a hazard. The soils have severe construction limitations. It primarily supports a native hardwood (Garry/California black oak) community.

Table 2-32. Pilot Rock ACEC, Pilot Rock Unit Soils (USDA 1993).

Soil #	Soil Name	Percent Slope	Acres	Percent of ACEC	Productivity Class *	Site Index **
20E	Bybee-Tatouche complex, south slopes	12 to 35	4.3	1.4	B PSME 7 T PSME 8	80 85
58G	Farva very cobbly loam, south slopes	12 to 35	13	4.1	PSME 6 ABCO 10	70 65
113G	McMullin-Rock outcrop complex	35 to 60	6.5	2.1	-	-
190E	Tatouche gravelly loam, north slope	12 to 35	67.2	21.2	PSME 8	90
190G	Tatouche gravelly loam, north slope	35 to 65	56.4	17.8	PSME 8	90
191E	Tatouche gravelly loam, south slope	12 to 35	45.6	14.4	PSME 8	85
191G	Tatouche gravelly loam, south slope	35 to 60	34.7	11.0	PSME 7	80
207E	Woodseye-Rock outcrop complex	3 to 35	15.2	4.8	-	-
207G	Woodseye-Rock outcrop complex	35 to 80	73.8	23.3	-	-

*Site Index. Height and age of selected trees in stands of a given species. A designation of the quality of a forest site based on the height of the dominate stand at an arbitrarily chosen age. Average height at 50 yrs = 75 feet. SI is 75. Age varies with species and soil type: 100 yrs. PSME on Pokegama and Woodcock units, PIPO all units; 50 yrs. PSME on all other units, ABMASH, and ABCO. ** Productivity Class. Yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands. ***PSME = *Pseudotsuga menziesii*, Douglas-fir; ABCO = *Abies concolor*, white fir.

Table 2-33. Pilot Rock ACEC , Mariposa Unit Soils (USDA 1993).

Soil #	Soil Name	Percent Slope	Acres	Percent of unit	Productivity Class *	Site Index **
17C	Brader-Debenger loams	1 to 15	12.9	5.4	-	-
27D	Carney clay	5 to 20	168.0	70.4	-	-
28D	Carney cobbly clay	5 to 20	15.4	6.5	-	-
28E	Carney cobbly clay	20 to 35	36.8	15.4	-	-
44E	Denbenger-Brader loams	15 to 40	4.9	2.1	-	-
82G	Heppsie-McMullin complex, south slopes	35 to 70	0.6	0.3	-	-
114E	McNull loam, north slopes	12 to 35	0.1	0.1	PSME 7	80

*Site Index. Height and age of selected trees in stands of a given species. A designation of the quality of a forest site based on the height of the dominate stand at an arbitrarily chosen age. Average height at 50 yrs = 75 feet. SI is 75. Age varies with species and soil type: 100 yrs. PSME on Pokegama and Woodcock units, PIPO all units; 50 yrs. PSME on all other units, ABMASH, and ABCO. ** Productivity Class. Yield in cubic meters per hectare per year calculated at the age of culmination of mean annual increment for fully stocked natural stands. ***PSME = *Pseudotsuga menziesii*, Douglas-fir; PIPO = *Pinus ponderosa*, ponderosa pine; ABCO = *Abies concolor*, white fir.

Hydrology

Pilot Rock Unit. Pilot Rock is situated at the confluence of three different watersheds: Scotch Creek to the east; Bear Creek (Emigrant Creek) to the north; Cottonwood Creek to the south (Hutton Creek) and west (Bear Gulch and unnamed Cottonwood Creek tributaries). It represents less than one percent of the each watershed.

The nearest weather station (now defunct) was at Siskiyou, located northwest of Pilot Rock below the pass near Exit 6 on I-5 at 4,000 feet elevation. Annual precipitation over the period the weather station was active was 22.5 in per year (WorldClimate, 1999). Yearly precipitation distribution is typical for other stations in the area with relatively dry summers and wet winters. Because of its elevation, all of the Unit is in the transient snow zone. Based on the Jenny Creek Watershed Analysis (USDI-BLM 1995; Table 1, page 9) snow may be on the ground three months (Dec., Jan., Feb.) here.

Examination of the USGS 7.5 Siskiyou Pass Quad shows no permanent streams in the Unit, although the intermittent streams serve as headwater sources for the permanent, fish bearing streams below. This map does not indicate springs or livestock/fire developments within the present boundaries of the Pilot Rock Unit. However, there are nearby springs in the Hutton, Cottonwood, and Emigrant Creek watersheds that probably rely on groundwater from the ACEC.

Mariposa Unit. The nearest weather station (now defunct) was at Hilt (2,900 ft elev) in California, just to the south (about 1.5 mi) of the ACEC. Annual precipitation over the period the weather station was active was 21.6 in per year (WorldClimate, 1999). Yearly precipitation distribution is typical for other stations in the area with relatively dry summers and wet winters. Because of its elevation, the Mariposa Unit is mostly out of

Table 2-34. Springs and Ponds near the Pilot Rock ACEC Unit

Description	Site Number and Legals	Lat./Long.	Comments
Hutton Creek Watershed			
Ponds	**1.** 41S02E03NW1/4SE1/4	42.01.46.53N/122.34.05.98W	Two adjacent stock ponds in meadow S of W saddle
	2. 41S02E10NE1/4NW1/4	42.01.24.41N/122.34.20.11W	Stock pond just below 41-2E-9.0. Fence in poor condition
	3. 41S02E11NW1/4NE1/4	42.01.21.47N/122.32.58.44W	Stock pond near end of 41-2E-3.1
Springs	**4.** 41S02E03SE1/4SE1/4	42.01.33.15N/122.33.43.42W	Just below 41-2E-3.1 SW of Pilot Rock
	5. 41S02E10SE1/4NE1/4	42.01.08.90N/122.33.46.76W	Mapped in Hutton Creek, associated with stock pond. Not fenced
	6. 41S02E11SW1/4NE1/4	42.01.17.99N/122.32.49.81W	Headwaters e fork Hutton Cr below 41-2E-3.1
Cottonwood Creek Watershed			
Pond	**7.** 41S02E09NW1/4SE1/4	42.01.57.42N/122.34.07.63W	Stock pond n of unnamed Cottonwood Cr. trib.
Springs (2)	**8.** 41S02E04SE1/4SW1/4	42.01.34N/122.35.40W	Just N of Chocolate Falls Cr. on private land.
Emigrant Creek Watershed			
Ponds	**9.** 41S02E03SW1/4NE1/4	42.01.57.42N/122.34.07.63W	Stock pond just N of W saddle. Not fenced
Springs	**10.** 40S02E34NE1/4SE1/4	42.02.38.84N/122.33.47.1W	On section line between 34 and 35
	11. 40S02E35NW1/4SW1/4	42.02.36.49N/122.33.40.53W	Just below 40-2E-35.0 Fenced

The condition and water quality/quantity of the springs and ponds is unknown.

the the transient snow zone. Based on the Jenny Creek Watershed Analysis (USDI-BLM 1995x; Table 1, page 9) snow may be on the ground for a month in January.

Main water course appears to be Chocolate Falls Creek. Chocolate Falls Creek has its headwaters below the bluffs in western part of the Pilot Rock Unit. The two springs (Table 2-34, **8.**) are associated with the creek upstream and outside the Unit. There are no mapped springs in the Mariposa Unit (USGS Siskiyou Pass 7.5 Quad.).

One of the reasons for the Mariposa acquisition was the abundance of year-round water sources. Dow (1995) reported a spring in willows south of Chocolate Falls Creek, but without running water in the draw in October 1995. He also reported an open well near the homestead site north of Chocolate Falls Creek There is a wet area just west of the freeway right-of-way that supports small willow and broadleaf cattail community.

Construction of Interstate-5 caused major changes in hydrological patterns in the Mariposa Unit. Runoff from Interstate 5 adds water to the area during precipitation events and snow melt via culverts and gutters. Runoff from I-5 is probably a major source of water for the tributary at the southern end of the Unit. Chocolate Falls Creek passes beneath I-5 through a large culvert. Water quantity or quality studies have not been done on streams in the area.

Vegetation

The plants and plant communities in both units of the ACEC have not been as carefully studied as those in Oregon Gulch and Scotch Creek RNAs. The following discussion is based on range surveys and several brief reconnaissance trips to the Pilot Rock ACEC. Begnoche (1999, page 39-40) provides an illustrated introduction to the wild flowers of the Pilot Rock area.

Pilot Rock Unit. Four main plant communities are located within the ACEC boundaries: high elevation mixed conifer, a juniper scabland, rocky meadow, Garry oak/ Prunus-meadow complex and a vernally wet meadow (map 37).

Mixed Conifer

This community has the usual assemblage of conifer species: Douglas-fir, ponderosa pine, and incense cedar. Because of its relatively high elevation white fir is a major component. Understory vegetation is often absent because of the closed canopy. Blue elderberry, ocean-spray, service berry and deerbrush are present in canopy openings. Open areas along the margins of rocky openings have chinquapin and greenleaf manzanita.

Much of the mixed conifer community on north slopes of the high hill to the west on both sides of Pacific Crest National Scenic Trail was selectively cut in the early 1960s. It was replanted with ponderosa pine, Douglas-fir, and Shasta red fir. Several of the Shasta firs have survived and at least one produces cones. In a sense Shasta red fir is an alien plant in the Pilot Rock ACEC. The nearest populations are at Mount Ashland to the west and in the high Cascades at Old Baldy to the east. Shasta Fir is absent from intervening area.

Juniper Scabland

Steep open areas on the west slopes of Pilot Rock near the below the basalt columns have western juniper and the occasional Douglas-fir scattered among patches of greenleaf manzanita, wild buckwheat, rabbitbrush, and Brewer oak.

Rocky meadow

The rocky area that forms a narrow border around the western boundary of the Pilot Rock ACEC Unit is Woodseye-Rock outcrop complex soil (207G) of andesite origin. The community consists of widely scattered western junipers with the occasional Douglas-fir. Low shrubs include wild buckwheat and phlox. Herbs include dagger-pod on drier sites and hesperochiron in low wet muddy areas in the early spring. The rock meadow is bordered by the mixed conifer community on the north and by a narrow Ponderosa Pine/ Western Juniper/Garry Oak - Buckbrush Klamath Plum community along the bluff edge to the south.

Garry oak/Prunus-meadow complex

The plant community on the lower slopes the ACEC consists of a Garry oak/ Prunus-annual grassland. The Garry oaks and Klamath plum make up dense thickets with occasional ponderosa pine. Alien grasses bulbous bluegrass (*Poa bulbosa*), medusa-head rye (*Taeniatherium caput-medusae*), hedgehog dogtail (*Cynosurus echinatus*), and various annual bromes (*Bromus spp.*) including cheatgrass (*Bromus tectorum*) are present in the grasslands. What native perennial grasses remain are frequently found under tree canopies (Idaho fescue (*Festuca idahoensis*) and June grass (*Koeleria micrantha*)) or in some open areas (Lemmon needle-grass(*Achnatherium lemmonii*, one-sided bluegrass *Poa secunda* ssp. *secunda*). At higher elevations replacement of native grasses by alien annual grasses is not as pronounced as it is at lower elevations.

Vernally wet meadow

The meadow is located near the stock ponds (table 2-34, 1.) south of west saddle. The meadow is dominated by various grasses. There is a population of false mermaid (*Floerkea proserpinacoides*) along the small waterway that flows into Hutton Creek at the lower stock pond.

Mariposa Unit. Five plant communities (Map 38) can be distinguished in the Mariposa Unit: Garry oak/Ponderosa pine woodland; Garry oak woodland; Garry oak savanna; Annual grassland; and a Riparian zone. There are scattered western juniper throughout the area. Communities were distinguished on aerial photographs based on the distribution and density of oak clumps. There are relatively few, large old trees, but many more, what appear to be younger trees that are probably a response to herbivory, fire, or both. Counts of wood cookies indicate the stems (but not necessarily the whole plant because of stump sprouting) hand mostly had 40 to 60 annual rings.

Garry oak/Ponderosa pine woodland

Islands of ponderosa pine and Garry oak occur sporadically throughout the area, but reach their greatest development with densest canopy on along the western boundary of the unit on areas mapped as Brader-Debenger loam. Shrubs include tall oregon grape and snowberry.

Garry oak woodland

Garry woodlands are made up of dense, short stature stands of oak with scattered ponderosa pine and western juniper. Shrubs include Klamath plum, serviceberry and buckbrush.

Garry oak savannas

This community is similar to the Garry oak woodland, except that islands of oak are interspersed in what are primarily annual grasslands. Small patches Klamath plum, serviceberry and buckbrush may be found around the fringes of the oak clumps, or form small brush fields, or stand as apart as small groups or as individual plants.

Oaks here are often of small stature 12-15 feet tall and of two levels, the lower outer level about 3 feet tall. The lower sprouts are similar in stature to Brewer oak, but are probably a result of browsing, not genetics.

Grassland

Grasslands are quite extensive. The largest contiguous grassland forms much of the south-facing slopes of Chocolate Falls Creek. There is a heavy stand of teasel from the freeway west along this slope. Other grasslands are found in openings in the oak savanna community. Alien grasses bulbous bluegrass (*Poa bulbosa*), medusahead (*Taeniatherium caput-medusae*), hedgehog dogtail (*Cynosurus echinatus*), and various annual bromes (*Bromus spp.*) including cheatgrass (*Bromus tectorum*) dominate these grasslands. Native perennial grasses include Idaho fescue (*Festuca idahoensis*) June grass (*Koeleria micrantha*), Lemmon needle-grass (*Achnatherium lemmonii*), one-sided bluegrass (*Poa secunda* ssp. *secunda*), blue wild-rye (*Elymus glaucus*), California oatgrass (*Danthonia californica*), and Squirrel-tail (*Elymus elymoides*). Forbs include species of delphinium, yampa, vetch, and biscuit root. Brock (1988) mentions good remnant pockets of Lemmon needle-grass and Idaho fescue in more wooded lower elevation sites west of I-5.

Riparian

The only extensive riparian area is along Chocolate Falls Creek. There, large Garry oak, California black oak and ponderosa pine shade the creek where they are present. Willows are the main streamside shrub.

Alien Plants and Noxious Weeds

Alien plants and noxious weeds are found in the Pilot Rock ACEC.

Pilot Rock Unit. Aside from the usual annual grasses the Pilot Rock Unit is relatively free of alien plants. Brock (1988) mentions that soft brome (*Bromus mollis*) and medusa-head rye and weedy natives tend to dominate the open slopes in the Pilot Rock-Hutton Creek area.

Mariposa Unit. Annual grasses are common in the open grasslands. There are extensive yellow star-thistle (*Centaurea solstitialis*) populations at various locations in the area that need attention. The area is at risk for invasion of dyers woad (*Isatis tinctoria*). Both dyer's woad and star-thistle have well established populations along I-5 that will probably act as a constant source of seeds for these species and of others. Wild teasle (*Dipsacus fullonum*) is very common in wet areas along the I-5 right-of-way and in the large meadow along Chocolate Falls Creek.

Special Plants

Two Bureau Sensitive Species (BSO) are found in both the Pilot Rock and Mariposa ACEC Units. Greene's Mariposa lily (*Calochortus greenei*) grows in open Garry oak thickets with high clay content soils in both ACEC Units. The largest populations are found in the Mariposa Unit. Detling microseris (*Microseris laciniata* ssp *detlingi*) is found in the Mariposa Unit as well as outside the Unit.

According to the Oregon Natural Heritage Program (1996) these two species are Federal Species of Concern and ONHP Category 1. It is Bureau policy to protect, manage and conserve BSO species and their habitats on lands administered by the BLM in such away that any bureau action will not contribute to the need to list these species.

Greene's Mariposa lily (*Calochortus greenei*)

Brock (1988) summarizes most of what we know about this local southwest Jackson County, Oregon and north-central Siskiyou County, California endemic species. Observed threats include herbivory by insects (moth), rodents (chipmunks), lagomorphs (rabbits), and ungulates (deer, livestock) and by human horticultural collecting and development activity. Brock (1988) could find little evidence that domestic livestock directly damaged plants any or more or less than native animals.

In the Pilot Rock Unit, the lily occurs in four large patches in small rocky openings and rock ledges where shrub and grass competition is less. Browse damage was slightly less severe in 1988 than in lower elevation at lower elevation sites.

In the Mariposa Unit, the lily occurs in scattered patches under Garry oak or Klamath plum or buckbrush where there are good remnant pockets of needle-grass and Idaho fescue. A survey map (Barnes and Watt undated notes, Medford District BLM) developed about the time of acquisition showed most of the populations along higher ground in the east portion of the unit near Exit 1.

Currently observed herbivory would be by native animals probably deer and rabbits, since livestock grazing ceased in the area in 1990. It is not known if elk consume the lily.

Detling microseris (*Microseris laciniata ssp detlingi*)

This tall dandelion-like member of the sunflower family has a very local distribution in the heavy clay soils and Garry oak chaparral of parts of the CSEEA west of I-5 (especially the Mariposa ACEC Unit T.41S.,R.02E.,Sec.09) and along the old Pilot Rock Road. 41-2E-9 east of I-5. Risks include livestock grazing and trampling, OHV use, and road construction. Presently, populations west of I-5 are safe from harm. Populations east of I-5 remain at risk from OHVs and livestock.

Animals

Formal animal surveys have not been conducted in either ACEC units with the exception of bat (Cross 1999) and butterfly (Runquist 1999) surveys at the Pilot Rock Unit and large game animals surveys (Theibes, ODFW, pers comm, 1999) at the Mariposa Unit and contiguous lands. Previous work that may be useful are St. John (1984) for reptiles and amphibians, Nelson (1997) and the Jenny Creek Watershed Assessment and Analysis, Appendix 10 (USDI-BLM 1995b) for vertebrates, and Trail (1999) for birds.

Pilot Rock Unit. Pilot Rock as the usual assemblage of higher elevation animals. Of particular interest in this Unit are butterflies, bats, and falcons.

Butterflies

Runquist (1999) collected in the Pilot Rock Unit the summer of 1999. Butterflies were remarkable in the Pilot Rock Unit for their diversity 50 species (Appendix P) and large numbers. According to Runquist (1999) hundreds of Lorquin's Admirals, Fritillaries, and Woodland Skippers would sometimes obscure the plants they were visiting. The richest area was on the open slopes of the western part of the Unit with 46 species. Only 26 species were found on the steep slopes of the eastern section that includes Pilot Rock.

One of the more significant butterfly discoveries was a colony of Sternitzky's Parnassian, a Klamath Mountain alpine endemic. Runquist (1999) attributes its presence to stonecrop populations in the area which are used by its larvae as its host plant.

Birds

Pilot Rock is listed by a historic nesting site for Peregrine Falcons. As far as is known, they nor Prairie Falcons currently use Pilot Rock for nesting. Trail (1999) cites J. Pagel's sighting of Peregrine Falcons at Pilot Rock. Constant disturbance by recreationists climbing the rock during the nesting season (fledging early July at this elevation), combined with historic pesticide problems, probably explains their absence. The Peregrine Falcon Nesting Survey of May, 1987 noted an absence of ledges and easy human access to the summit. Pilot Rock was not given a site value. Although the Peregrine Falcon has been delisted, the BLM will continue to treat it as a Bureau Sensitive Species.

Bats

Three rare bat species were listed in the Nomination Document (USDI-BLM 1988): Townsend's big-eared bat (*Corynorhinus [Plecotus] townsendii*); Pacific pallid bat (*Antrozous pallidus pacificus*); and fringed myotis (*Myotis thysanodes*). There are extant records for the pallid bat and the fringed myotis (Cross 1999). However, Townsend's big-eared bat was placed on the list as a strong possibility because of the availability likely roosting sites in the vicinity (C Oakley, USFWS, pers comm 1999). Unfortunately, Townsend's big-eared bat is very difficult to mist net (Cross 1999) and is most commonly encountered at their roost net sites. No attempt has been made to locate the bat at suitable roost sites in the Pilot Rock area.

Cross (1999) mist-netted for two nights on two stock ponds (table 2-34, 1. and 9.) in the Pilot Rock area late in the season (early September). Although he did not find the three target species, Cross mist-netted five other species: the California myotis (*Myotis californicus*), Long-eared myotis (*Myotis evotis*), Long-legged myotis (*Myotis volans*), Yuma myotis (*Myotis yumanensis*), and Big Brown bat (*Eptesicus fuscus*).

At least seven bat species are known to inhabit the Pilot Rock Unit. They utilize the local stock ponds for water and prey, and nearby snags, cliffs, and rock faces for roosting or nesting sites. The presence of an eighth bat, Townsend big-eared bat, is hypothetical at Pilot Rock.

Mariposa Unit. There have been no intensive animal surveys done in this unit except for large game animals. It is unlikely that the area contains any species of concern. Animals include those typical of lower elevation Garry oak/Ponderosa pine/Annual grasslands. The area is used as habitat by variety of animals including rabbits, deer, and elk may graze on Greene's mariposa lily. The area has not been surveyed for invertebrates.

Fish

There are no fish in the Mariposa Unit. Chocolate Falls would act as a barrier, even if there was enough water in the creek to support fish year round. The other intermittent stream is too small to support fish in the Unit. Both intermittent tributaries do flow into Cottonwood Creek, a fish-bearing stream. Chinook salmon, steelhead, and speckled dace are know to occur in the creek to the Oregon Border (Dennis Maria, pers. comm.). In wet years chinook go up as far as Hutton Creek. Cottonwood Creek has not been surveyed beyond this point.

Amphibians

Although black salamanders are known in the Cottonwood Creek watershed, there is no suitable talus habitat in the ACEC.

Mammals

There are no rare or sensitive mammals found in the area. Animals that might pose a risk to Greene's Mariposa Lily are rodents, rabbits, and native and non-native ungulates: black-tail deer and cattle (Brock 1988). One reasons given for acquisition of the unit was to add to additional winter range for deer and elk (USDI-BLM 1992, Exhibit C).

Elk are know to use the area year round. Six were seen June, 1999 in the Chocolate Falls Creek riparian zone. Twenty seven were counted by Oregon Department of Fish and Wildlife at their last winter tally in 1998 (Theibes ODFW, pers comm 1999). Elk have been in the area for four to five years, about five years after livestock grazing ended. Theibes believes the elk do not migrate across the highway, but do move up and down the valley.

Grazing

Domestic livestock grazing has been a part of the landscape for over 100 years. Thousands of head of livestock were driven over the Oregon/California Trail through the Mariposa Unit from the from the 1830s until more modern times. Fence construction, the establishment of ranches and grazing districts, and modern transportation systems led to some control over grazing practices. Wright (undated) wrote that hundreds of cattle were let loose to graze the southern slopes of hillsides between Hornbrook and Pilot Rock in the springs following the hard winters of 1889-90. Grazing controls on public lands in the area did not occur until the federal government became involved.

Pilot Rock Unit. Pilot Rock Pasture is part of the Soda Mountain Grazing Allotment. Before 1986 the pasture had heavy use. With the construction of fences and changes in allowed AUMs grazing pressure dropped from earlier levels. Except for a few cows that have drifted in from other pastures, 1996 was the last year the pasture was used.

Mariposa Unit. The Siskiyou Allotment encompasses all BLM land west of I-5. Because of the historic Oregon/California Trail and private ownership lands now included the Siskiyou Allotment were heavily grazed in earlier times. Livestock has not been on the allotment since 1990.

Transportation

Interstate 5 and two versions of US 99, separate the two Pilot Rock ACEC Units. Access to the Pilot Rock ACEC was discussed earlier. This discussion deals with the official and unofficial roads in the ACEC

Pilot Rock Unit. All roads in the ACEC are unsurfaced except for the Pilot Rock Road (40-2E-33) and Road 41-2E-3.0 to the rocked parking lot at the saddle west of Pilot Rock. Unsurfaced roads are passable during dry weather, but quickly become muddy and rutted during wet weather. Roads 41-2E-9.0 and 41-2E-3.1 pass below the south face of Pilot Rock. Road -9.0 terminates at private land currently owned by Boise-Cascade Inc. Road 41-2E-3.1 traverses further down the ridge to a stock pond (table 2-34, 3.). The road is overgrown with a dense stand of incense cedar along the upper section.

An informal jeep road travels west up through the rocky meadow plant community from just north of the cattle guard and fence on 41-2E-3.1. The road follows the meadow around the west face of the ACEC boundary north to the Pacific Crest National Scenic Trail and beyond. The road appears to be well traveled. Its use should qualify as off-highway travel and road should be closed.

There is a closed unnumbered dead-end logging spur road through the 1963 selective cut to the west of the parking lot that parallels the Pacific Crest National Scenic Trail. The road seems to be slowly growing in with native shrubs.

OHVs have been using the trail to the summit of Pilot Rock although it has been blocked by boulders at the lower end. As a result, the former jeep trail is not being naturally reclaimed.

Mariposa Unit. There is no legal access to the Mariposa Unit. However, access is available via the broken freeway fence at Exit-1, or the small road from the southbound lane of I-5 north of Exit-1 that leads through a locked gate (non-BLM lock) to the buried telephone line. Presently, here are no established roads in the Mariposa Unit except for the road just mentioned. Access from U.S. 99 from the east was possible before the Interstate Highway was built. In the past, there have been a number of informal roads in area near Exit 1 that are slowly being reclaimed. Barnes and Watt (no date) sketched the location of these roads on their map of the area. There appears to be little OHV damage although recent tracks (December 1999) through the freeway fence indicate OHV activity.

The old Siskiyou Trail and the Oregon/California Wagon Road pass through the Mariposa Unit, as well documented by Silva (1999). The Siskiyou Trail and the Oregon/

California Wagon Road are of major historical significance as the major route of commerce and travel between the two states. At the present time the old road and trail are in good to excellent conditions (R Silva, Yreka CA, pers comm).

Recreation

Recreation is a major activity in the ACEC. BLM has no recent assessment of the recreational use of the area.

Pilot Rock Unit. Hiking, climbing Pilot Rock, and horse trail riding are major recreational uses of the area.. Hunters also use the area and associated roads. Other uses include sightseeing, nature study, photography, and camping also occur.

Three trails in the area are: the Pacific Crest National Scenic Trail (PCNST) which traverses the through the north boundary of the ACEC; the trail to the base of the volcanic plug; and a trail around the southwest base of the rock. The track around the west boundary through the rocky meadow to the PCNST makes an easy loop route from the parking lot.

Pacific Crest National Scenic Trail

About 1.5 miles of the PCNST traverse the north boundary of the Unit. Most recent trail use figures are from a 1980s trail counter that show 8,000 users traveled between Pilot Rock and Soda Mountain (USDI-BLM 1998) over the time the counter was in use. In one season there were 50 through hikers , the highest recorded at the time. The PCNST trail registration station just beyond the spur trail to Pilot Rock does not appear to have been used for sometime. The trail is in good condition.

Spur Trail To Pilot Rock

To reach the Rock climbers use the PCNST for about 0.2 miles, then turn up hill on an old jeep track/trail for another 0.2 miles. The trail broadens out to 15 to 20 feet wide once it reaches the open slope of the juniper scabland. The trail is steep and slippery, even under dry conditions. There is an ugly graffiti covered rock to the northeast that adds nothing to the climbing experience. Once the trail reaches the rock, the route to the summit is a non-technical scramble up the West Gully. There are no safety devices, hand lines or guard rails. People climb the rock at their own risk. At least two people died from falls from Pilot Rock previous to 1988 (USDI-BLM 1988) and several have been injured.

There are seven technical routes to the summit described by Dodge (1975) on the northwest, west, south and southeast faces. West Gully is frequently used as a decent route because it is easy and short (Dodge, 1975). There is a small climbing feature, called the Pinnacle, two hundred yards southeast of Pilot Rock at the end of 41-2E-9.0. Climbing hardware is in place on the Pinnacle, it is not known if hardware is present on the climbing routes on Pilot Rock itself.

Vehicle access to the PCNST and the trail to Pilot Rock is blocked by large boulders. However, OHVs have found a way to access the trail to the Rock widening the trail and destroying vegetation in attempting to drive around downed trees across the trail.

Base Trail

A trail travels southeast along the base of the rock to access south and southeast technical climbs. It is not maintained and is rough, working its way up, down and around large rocks and boulders.

Mariposa Unit. Hunting is major recreational use of the area. Dow (1995) reported a camp site in a wooded area in the southwest part of the area. He also found NO HUNTING signs posted by a private party along the west side I-5 right-of-way. OHV use is not allowed in the area.

Facilities

Pilot Rock Unit. The only constructed features beside the roads, parking lot, and trails are a broken-down metal gate at the top of the old Pilot Rock Road (41-2E-3.0), the unused PCNST trail kiosk. The livestock developments (stock ponds, cattle guard on 41-2E-3.0, and fences do not appear to be within the present boundary of the ACEC.

Mariposa Unit. With the exception the buried U.S. West telephone line that passes north through the northeast corner of the Unit and livestock fences there are no modern constructed features in the Unit. Remains of an old homestead and what appears to be a water-well are located near Chocolate Falls Creek in the northeast corner of the Unit (Dow, 1995). Dow recommended that the well be posted or filled

Soda Mountain Wilderness Study Area

The Wilderness Study Area (WSA) which has an irregular shape, contains approximately 5,867 acres, all public land (see map 2). About half of the WSA is public domain lands with the remainder Oregon and California (O&C) lands.

The area is bounded on the south and west by the Schoheim Road and on the west and northwest by the Lone Pine Ridge Road, both low standard dirt roads, and on the east by a power line. The northern boundary is on the flanks of Soda Mountain, and the western boundary is along Lone Pine Ridge. Adjacent lands are a mixture of private and public lands including Scotch Creek RNA to the southwest. The boundaries are clearly marked by signs.

The WSA lies on the steep, south-facing slopes of the Soda Mountain area. It contains ridges and peaks varying in elevation from 2,800 to 5,700 feet. Camp Creek, Dutch Oven Creek, and Salt Creek dissect the WSA.

The WSA was recommended for wilderness designation by the State Director in 1989 and the President in turn, recommended it for designation to the Congress in 1991. To date no Congressional action has been taken on these recommendations so the area is managed under the BLM's Interim Management Policy for Lands Under Wilderness Review. The Policy insures that the Area's suitability for wilderness designation will not be impaired by proposed activities.

Vegetation

Southwestern Oregon is the meeting place of a variety of climates, soils, and topography, resulting in an extremely diverse mix of vegetation. While the WSA is primarily in the Klamath River Ridges Ecoregion, contiguous ecoregions intermingling contributing to great vegetational diversity and ecotonal overlap. Throughout the WSA there are three major vegetative types: stands of mixed conifers and hardwoods; extensive dense, brushy areas; and some open, grassy areas. Further investigation will probably show that these vegetation types are similar to the plant communities described for the Scotch Creek RNA.

Slightly more than half of the WSA has communities of white oak-ponderosa pine/Idaho fescue and a shrubby grassland of wedgeleaf ceanothus/bluebunch wheatgrass. These communities are generally found on shallow, rocky soils in the southeast and northwest portions of the area. The oak-pine/fescue community tends to occupy gently rolling terrain at lower elevations to steep, south-facing slopes at higher elevations. A variety of forbs is present.

About 20-30 percent of the WSA, near Lone Pine Ridge, supports a steep mountain grassland (Idaho fescue/wooly sunflower) and another shrub-grassland complex composed of birchleaf mountain mahogany-white oak/Idaho fescue. These communities occupy steep slopes.

The white fir- mixed fir forest community makes up 5-10 percent of the WSA vegetation, south of Soda Mountain itself, and extends into major creek drainages. This climax community contains white fir and Douglas-fir as dominants and various shrubs and forbs in the understory.

The oak-shrub association is found over much of the WSA and is generally maintained by fire. These sclerophyllous shrubs, because of their thickened, hardened leaves, tend to grow in dense stands. In this area, the plant community is dominated by wedgeleaf ceanothus with other species such as mountain mahogany.
Known noxious weeds within the WSA include yellow star thistle which occurs along the southern grassy areas, dyer's woad which occurs along the Lone Pine Ridge road, Canada thistle, and medusahead. Efforts are underway to control starthistle with biological controls. Yellow starthistle insect predators were introduced in 1999, with additional applications scheduled for the next three years.

Klamath Weed is another noxious weed suspected of being in the WSA but its presence has not been confirmed.

The steep terrain, dense brushfields, limited stands of commercial timber, and difficult access have all contributed to keeping the area in an essentially natural state.

Geology

Exposed rocks in the area are composed of non-marine volcanics of the Western Cascade Range. These mid-Tertiary basaltic andesite flows are interbedded with breccias and pyroclastics. Underlying formations are composed of andesitic flows, pyroclastic and volcaniclastic early Tertiary sediments, and early Tertiary to Cretaceous non-volcanic, non-marine sediments. These strata have subsequently been faulted and intruded.

Mineral Resources

There are no oil/gas, geothermal or coal leases, or mining claims within the WSA. See the general mineral section above for results of the USGS survey.

Livestock Management (Grazing)

Current livestock use has been limited to the upper portions of the WSA with no grazing in the lower elevations. A range fence extends along the ridge east of Salt Creek for approximately 3.5 mile and a way which was developed for livestock gathering purposes extends from the northeast part of the WSA to the southern boundary near Salt Creek.

Wildlife

The WSA contains populations of black-tailed deer, bear, coyotes, quail, cougar, bobcats, and possibly elk which are all hunted during the appropriate seasons. The area also contains approximately 1,000 acres of a spotted owl management area. The presumed nesting area is outside the WSA. The south slopes and lower elevations (under 2,500 feet) combined with lands in California constitute crucial winter range for the black-tailed deer herd.

The climatic conditions, terrain and vegetative communities in the WSA result in a diversity of wildlife habitats. The plant communities in this area form one of the most unusual mosaics of habitat types found in southwestern Oregon, as described above in the vegetation section. The variety of stand conditons (seral stages), structure of vegetation and ecotones in these communities form the diversity of wildlife habitats in the WSA.

Camp Creek and Dutch Oven Creek contain viable populations of rainbow trout. These populations currently receive light pressure from anglers.

Recreation

Recreation in the WSA includes hiking, camping, hunting, very limited fishing, backpacking, rockhounding, wildlife observation, horseback riding, sightseeing and photography. The legal use of vehicles is limited to the two miles of the existing way between the powerline and Schoheim Road in the southeastern corner of the WSA. Occasionally vehicles violate the Interim Management Policy for Lands Under Wilderness Review and drive into the WSA. The vast majority of these violations occurs during hunting season.

Approximately one mile of the Pacific Crest National Scenic Trail (PCNST) passes through the northwest portion of the WSA. A majority of use on the trail is by day-hikers traveling between Pilot Rock and Soda Mountain. Approximately 50-100 through-hikers travel the trail from Mexico to Canada yearly. Aside from the PCNST , there are no other trails or developed facilities within the WSA. There are no accurate figures for the other recreational uses of the WSA but 17 years of monitoring has shown use to be extremely low with people driving for pleasure or hunting as the types of use most often observed.

Box-O Ranch

The Bureau of Land Management (BLM) acquired the 1,200-acre Box-O Ranch in May of 1995. The Ranch had been on the market for several years. The BLM, having been involved in restoration work in the Jenny Creek Watershed for eight years prior to that, recognized that re-establishing riparian vegetation on the ranch was an important step in restoring the watershed and improving habitat for the redband trout and Jenny Creek sucker. The BLM determined that acquisition was an appropriate action toward completing this task.

The Box-O Ranch is located in southwestern Oregon in Jackson County approximately five miles south of Highway 66 (Greensprings Hwy.) on the Copco Road. The ranch lies within the Jenny Creek Watershed which is tributary to the Klamath River in California. The Ranch is located in Township 40 South, Range 4 East and covers portions of sections 21, 22, 27 and 33, and all of section 28.

The Box-O Ranch straddles 2.5 miles of Jenny Creek. Elevation on the Ranch varies from roughly 3,000 feet at streambed level at the south end of the ranch, to approximately 4,000 feet on the slopes of Rosebud Mountain in the northwest corner of the ranch. There are approximately 330 acres of bottom-pasture land. The remainder of the 1,200 acre ranch is upland.

The following text discusses the physical characteristics of the Ranch and its resources. Together these topics make up the existing environment.

Access

The Box-O Ranch lands are accessed primarily from Copco Road that parallels the Ranch on the east side. Copco Road is now owned by U. S Timberlands Services Company; however, a number of local residents and the public use it as if it is a public road. There are two tie roads to the Ranch off Copco Road, and both cross over U. S. Timberlands Services Company land for a short distance. One of these roads, 40S-4E-27.1, accessed the old Grieve Ranch complex on the north end of the Box-O Ranch, but it is presently unuseable due to slides and erosion. A special road use permit has been acquired from U.S. Timberlands Services Company so this road can be improved. The second tie road, 40S-4E-27.2, enters the property on the southeast corner. This is currently the primary access to the Ranch. A third road enters from the north through the Box D Ranch and U. S. Timberlands Services Company land. This is not a public road and BLM access is possible only by permission from the Box D Ranch. A fourth route, 40S-4E-28.2, entered the Box-O Ranch via the Oregon Gulch Road from the west, but this road was decommissioned and obliterated west the Ranch boundary in 1996.

Climate

Annual precipitation on the Box-O Ranch is estimated at 20 inches along Jenny Creek, with the uplands to the north and west probably receiving an additional one to two inches. Monthly average precipitation indicates that 70 percent of annual precipitation occurs between November and March. Precipitation during the winter months generally occurs as rain or snow in association with low pressure systems moving out of the Gulf of Alaska. Snowpack of 12-24" are probably not uncommon on the Ranch. These are transient in nature, generally lasting no more than a few weeks. Dry season storms tend to be convective in nature, usually short in duration, but sometimes accompanied by high winds, heavy rain or hail, and lightning. The ten-year period ending in 1994 was characterized by numerous below-normal precipitation years. However, the 1995-97 water years had normal to above-normal precipitation.

Stream Channels

The "Stream Channels" section included earlier in this chapter provides details about historical events leading up to current conditions in the Jenny Creek Watershed. These events were responsible for a fundamental change in stream channel, floodplain and riparian conditions on the Box-O Ranch. Stream channeling resulted in significant changes.

With the early development of the Ranch, the floodplain was cleared to provide more pastureland. Intensive grazing led to soil compaction, which subsequently caused decreases in infiltration and increases in runoff on the floodplain. Because of declining water tables, irrigation of the floodplain became necessary for longer periods each year. Irrigation was applied on surrounding valley slopes as well. During annual high flow events, the stream would still inundate the floodplain, depositing debris on the pastures and providing a dangerous situation for livestock. The inundation also rendered large areas of pasture unusable at certain times of the year. This situation led to deliberate efforts to channelize the stream. Eventually, much of the stream was straightened out, substrate material was scooped out of the channel to form berms which prevented the stream from exceeding its banks, and stream-side shrubs and trees were removed to prevent debris jams from forming or channels from migrating. Between 1939 and 1996, the total length of Jenny Creek on the Ranch was reduced from approximately 15,660 feet to 13,505 feet, a loss of 2,155 feet of main channel. Measured width/depth ratios range from approximately 16 to 57, which are very wide and shallow for this type of stream.

These changes have greatly increased stream energy on this portion of Jenny Creek by concentrating flood flow and increasing the stream gradient. Channelization and loss of natural meander has lead to loss of the natural stream bottom profile, which in turn has decreased the stream's ability to transport bedload, increasing stream velocity in the near-bank region. Until recently, grazing pressure from livestock, deer and elk has allowed for little vegetative recovery along the stream. Impacts resulting from past excessive grazing pressure continue to contribute to streambank erosion. With little structure to capture it, high stream energy allows naturally occurring woody debris to pass through the system. Some streambanks are still being cut as energy is diverted laterally by channel confinement, leading to a wider, shallower stream at low flows. Elsewhere on the Ranch, stream-side berms, coupled with the drop in stream elevation prevent Jenny Creek from utilizing the floodplain in all but the largest floods. Sediment is no longer regularly removed from the streambed and captured by the floodplain, and the floodplain is no longer able to absorb stream energy during high flows. As a result of these channel modifications on the Ranch, the downstream aquatic ecosystem has been placed at risk due to increased peak-flows and sedimentation.

Since the acquisition of the Ranch, streambanks have begun to stabilize and riparian vegetation has experienced remarkable growth. BLM has been pro-active in riparian restoration and has planted several thousand ponderosa pine and hardwood trees along banks of Jenny Creek. Three berms along the stream on the north end of the Ranch have been removed which will permit high flows to once again access the floodplain in that reach.

Other stream and wetland features on the Ranch include perennial streams, intermittent streams with annual scour and deposition, dry channels, springs, seeps, and wetlands. Many of the intermittent tributaries on the Ranch are devoid of riparian vegetation, and some show evidence of continued downcutting and widening. Reduced grazing pressure during the past few years has resulted in many of these seemingly dry intermittent channels beginning to be re-colonized by riparian hardwood species, with many ash, willow and other saplings appearing. Other streams are ephemeral and capable of supporting very limited amounts of riparian vegetation due to a lack of water. This situation makes them especially sensitive to activities resulting in vegetation removal and soil disturbance. Such stream channels on the Ranch account for the greatest sediment delivery volume of all stream types during major storm events. This is due to relative steepness, minimal presence of riparian vegetation, and high density across the landscape.

Until 1999, many of these streams were intercepted by irrigation ditches on the Ranch. During major flow events, the water entering the existing ditch system on the Ranch overwhelmed the transport capacity of the irrigation ditches, and breaches occurred. Numerous locations along the ditches show evidence of past ditch failures and associated erosion resulting from these breaches. Some of the resulting gullies exceed eight feet in depth. A rain on snow event occurred in January 1997 which resulted in a major failure on the eastside ditch near the north end of the Ranch. In the fall of 1999, the irrigation ditches were breached at many of the natural flow paths which will allow these channels to become restored over time.

Oregon Gulch, an intermittent fish-bearing stream, is the largest of the tributaries on the Ranch. It has a drainage area of approximately 2000 acres. The final few hundred yards of the stream flow down an alluvial fan into Jenny Creek. The channel is deeply entrenched, with evidence of stream straightening and bank riprap. Remnant riparian vegetation is very sparse, but is showing signs of increased establishment. Aerial photos from 1939 and the early 1960s show substantially more large riparian vegetation, with little evidence of channel entrenchment. Aerial photos for 1966 show evidence of channel change from the 1964 flood, including new deposits of gravel and reductions in vegetation.

Comparison of various aerial photos dated 1939-1991 show patterns of increasing channel and riparian degradation, both on tributaries and the main stem of Jenny Creek. Riparian vegetation had decreased, channel width had increased, and the channel had been straightened (with a corresponding loss of stream structure).

Water Quantity

There are no continuous streamflow-monitoring stations on natural flowing streams in the vicinity of the Jenny Creek Watershed. Instantaneous flows are measured or obtained by BLM personnel from staff gage readings during visits to the monitoring station located at the north end of the Box-O Ranch, or estimated from measurements of flood marks following major flow events. Observed flows for the period of July 1991 to July 1997 have ranged from a low of 1.2 cubic feet per second (cfs) in July 1992 to an estimated 7000+ cfs in January 1997.

Peak flows on Jenny Creek at the north end of the Ranch have been calculated for various recurrence intervals using USGS flood frequency equations. These analyses indicate a range of flow for an event with a two-year return interval between 1,873 and 4,549 cubic feet per second (cfs), and for a 100-year return interval, between 5,033 and 16,968 cfs (Squyres 1995).

The most recent major flow event on January 1, 1997, followed more than a month of above-normal rainfall and several days of intense, warm rain. Data from three rain gauges in and around the Upper Jenny Creek area indicate more than five inches of rain fell in the three days prior to the flood. Rainfall intensities, change in snow pack, and flow impacts in Jenny Creek relative to other areas in Southwest Oregon suggest that this flow event was probably a 10-25 year return interval event in the Jenny Creek Watershed. Reservoirs at Howard Prairie, Hyatt, and Keene Creek were all full prior to the onset of the peak flow event, providing no decrease in the size of the downstream peak flow.

On the Box-O Ranch, much of the identified flood-prone area was inundated. While an actual slope/area measurement of the flood to determine flow has yet to be done, it is estimated that the flow on the Ranch was greater than 7000 cfs. Quantites large woody material and fine sediments were deposited at numerous locations on the historic floodplains; berms continued to be eroded or overtopped; and large accumulations of cobble and gravel occurred at several locations on the Ranch. In general, newly recovering vegetation along the stream came through the flood relatively intact. A debris torrent originating on private timberland to the east came down Parker Creek, a stream intercepted by the Box-O east side irrigation ditch. A large alluvial fan formed at the base of the draw, burying the ditch and ditch access road in cobbles and boulders up to two feet in diameter, and filling the ditch with mud for a considerable distance both upstream and downstream of the site. Several other ditch failures occurred, following a pattern that has been observed annually since hydrologic monitoring began on the Ranch in 1991. One such failure contributed approximately100 cubic yards of fine sediment directly into Jenny Creek during a storm event in 1996, then a failure during the 1997 New Year's Flood contributed more than 300 cubic yards of material at the same location. These ditch failures are directly attributable to the interception of flood flows and associated bedload and debris at ditch/stream crossings. The concrete diversion structure for the east side ditch came through the flood relatively intact. The boulder push-up dam for the west side ditch was totally obliterated. Flood flows from

Jenny Creek were diverted down both ditches, contributing to other ditch failures and stream sedimentation from eroding outfalls. The first portion of the west side ditch was also blocked by deposition of a large cobble bar at the diversion point.

The biggest impact to flows in Jenny Creek on the Box-O Ranch occurs during the summer months when low flows are dramatically reduced due to diversion at upstream TID dams, and to a lesser extent by other water withdrawals for use within the watershed. Although approximately 31 percent of the Jenny Creek Watershed upstream of the Ranch is diverted by the dams, the corresponding reduction in summer low flows is probably much greater than 31 percent. The portion of the watershed draining into the reservoirs represents the area of highest annual precipitation, greatest snowpacks, and greatest natural water storage.

The Oregon Department of Fish and Wildlife (ODFW) filed an Instream Water Right application to maintain specified minimum instream flows in Jenny Creek from the mouth of Johnson Creek downstream to the mouth of Keene Creek. Necessary minimum flows range from 4 cubic feet per second in September to 16 cubic feet per second in March through May. Identified uses are fish migration, spawning, egg incubation, fry emergence, and juvenile and adult rearing. The Box-O Ranch is downstream from the area covered under this application, and below Keene Creek, a major Jenny Creek tributary. Minimum streamflows needed in Jenny Creek on the Box-O Ranch are probably greater than those identified upstream by ODFW. BLM, in cooperation with Oregon Water Trust, has made application with the Oregon Water Resources Department to transfer the irrigation water rights for the Ranch to in-stream use for the benefit aquatic resources.

Water Quality

Changes in the stream channel and in summer flows have had significant impacts on Jenny Creek water temperatures on the Ranch. Although no stream temperature data exists for the period prior to construction of the irrigation system dams in the watershed, existing data indicates that there are much greater increases in stream temperature on the Ranch in years having reduced flows. This supports the theory that summer flows in Jenny Creek on the Ranch were significantly higher and stream temperatures were consequently lower prior to construction of the dams.

Stream temperatures at the north end of the Ranch range from near 32° Fahrenheit (F) in the winter to the mid to upper 70s in the summer. Peak 7-day maximum temperatures for the period of record range from 72-78°F, with years with lower streamflows apparently generating lower stream temperatures. This is due to springs contributing a much higher percentage of the total streamflow during low flow years causing the lower temperatures. This becomes even more apparent when comparing annual differences in diurnal fluctuation. In 1993, diurnal fluctuation in August averaged 13.1°F, while the same period in 1994 had diurnal fluctuation of 4.8°F.

At the south end of the Box-O Ranch, winter time stream temperatures near 32°F are common, with summertime maximums in the low to mid 80s. The maximum temperature measured at the south end of the Ranch to date was 86.9°F on July 20, 1994. Seven-day maximums for the period of record range from 80.5 to 84.2°F. Stream temperatures above 80°F often occur early in the season on this portion of Jenny Creek. For example, the first 80+ °F day in 1992 (a low flow year) occurred May 24; in 1993, a slightly above normal flow year, an 80+°F temperature was not recorded until August 2. Annual maximum seven-day average diurnal fluctuation has ranged from 17.2 to 20.7°F, with the maximum variations occurring in May or June during low flow years, and late July or August in higher flow years (Appendix U).

Summertime stream temperatures increase dramatically in Jenny Creek between the north and south boundaries of the Ranch. These increases are presumably much greater than increases under natural conditions before the establishment of the ranches. Decreased stream shade, high width/depth ratios, reduced summer flows, and decreased bank storage associated with falling water tables and reduced wetlands have all contributed to this situation. Maximum annual water temperature differences between the north and south Ranch boundaries during the past few years have ranged from a six degree increase during normal flow years to as much as a 15°F increase during drought years. Summer water temperatures at the south end of the Ranch are high enough to be lethal to almost all or all cold water invertebrates.

Existing Condition in Relation to Aquatic Conservation Strategy Objectives

The connectivity between floodplains, wetlands, up slope areas, and headwater tributaries is in a degraded state, with areas critical for fulfilling life history requirements of aquatic and riparian-dependent species often physically obstructed by factors such as elevated stream temperature, unnaturally low summer flows, or an impassible diversion dam. The physical integrity of shoreline, bank, and bottom configurations is severely degraded. Water quality, specifically temperature, is outside the range that maintains the biological, physical, and chemical integrity of the system. These conditions limit the survival, growth, reproduction, and migration of individuals that compose aquatic and riparian communities. The timing, volume, rate, and character of sediment input, storage and transport has been drastically altered. Instream flows are not presently maintained to sustain riparian, aquatic, and wetland habitats, or to retain patterns of sediment, nutrient, and wood routing. The timing, magnitude, duration, and timing of peak, high, and low flows have been fundamentally altered by water withdrawals and diversions, and to a lesser extent by other land-management practices. Floodplain inundation is now rare and water table elevation in meadows and wetlands has declined dramatically. Species composition and structural diversity of plant communities in riparian areas and wetlands are severely inadequate to provide summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion. Species composition and structural diversity of plant communities in riparian areas and wetlands are also inadequate to prevent bank erosion and channel migration or to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability. Habitat is insufficient to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

Riparian and Aquatic Vegetation

Riparian habitat in the Box-O Ranch's valley appears quite different than it did prior to pioneer settlement. Not only is riparian vegetation sparse along Jenny Creek, but the plant species composition is limited as well. The primary species are white alder (*Alnus rhomboides*), creek willow (*Salix spp.*), sandbar willow (*Salix spp.*), Oregon ash (*Fraxinus latifolia*), Garry oak (*Qercus garryana*), black hawthorn (*Crataegus douglasii*), western juniper (*Juniperus occidentalis*), several sedges (*Carex spp.*), and some ponderosa pine (*Pinus ponderosa*) and wedgeleaf ceanothus (*Ceanothus cuneatus*). A variety of native and introduced grasses and forbs make up the ground cover.

The vegetation composition along tributary streams above irrigation ditches is similar to that along Jenny Creek, however, oak, pine, juniper, ceanothus and some Douglas fir (*Pseudotsuga menziesii*) are dominant on west side streams. Ponderosa pine, Douglas fir, ash, wedgeleaf ceanothus plus some sugar pine (*Pinus lambertiana*) and deerbrush (*Ceanothus integerrimus*) comprise most of the stream bank vegetation on east side tributaries and seeps.

Aquatic vegetation in Jenny Creek includes cattail (*Typha latifolia*), hard-stem bullrush (*Scirpus acutus*), water milfoil (*Myriophylum sp*), pond weed (*Potomogeton crispus*), and some rushes (*Juncus spp.*).

Summer cattle grazing has occurred on the Ranch in past years. Young willows and sedges were consumed as pasture grasses were depleted or dried. The Ranch has had a rest from intensive summer grazing since 1994, and riparian vegetation has shown a remarkable recovery, even along the toe of eroded stream banks. Plant of trees and shrubs by BLM since the acquisition has contributed to the recovery.

Fish and Aquatic Wildlife

Three native fish reside in the Jenny Creek watershed: the Jenny Creek redband trout (*Onchorhynchus mykiss ssp.*), the Jenny Creek sucker (*Catostomus rimiculus*), and the speckled dace (*Rhinichthys osculus*). Of the three native fish, speckled dace are by far the most numerous. Sucker numbers are low in comparison to both dace and trout. These fish and other aquatic resources are discussed in detail in the section "Aquatic Resources" earlier in Chapter 2, The Existing Environment.

Both the suckers and the trout migrate up and down Jenny Creek, sometimes just "moving through" the Box-O Ranch, and sometimes "hanging out" for a few months at a time. In general, both the suckers and trout migrate upstream to spawn in tributaries in the spring, and some (probably not all) migrate back downstream in the fall to overwintering areas.

For both the suckers and the trout, the Box-O Ranch is an important part of the Jenny Creek watershed. For the suckers, the Ranch is downstream of their primary spawning streams, Corral and Beaver Creeks. When the young hatch, they are very tiny, and drift downstream until they reach the first flat, slow-water areas which are on the Box-O Ranch. Most of the newly-hatched suckers can be found on the Ranch or just upstream. Therefore, the Ranch is a critical "nursery" for the suckers.

The trout through the Box-O Ranch, on the other hand, tend to be older fish. The Ranch does not provide the only habitat for larger trout as they are found throughout Jenny Creek. Young trout appear to stay in their spawning tributaries.

The speckled dace are very common throughout the Box-O Ranch. As mentioned above, the dace are the most numerous of the three native fishes in Jenny Creek. They are found throughout the rest of the Jenny Creek system, with the exception of fast-water tributaries like Keene Creek.

During the springs of 1995 to 1999, trout fry were observed in the lower portion of Oregon Gulch. A June 1997 survey revealed that they were extremely abundant, using the entire stretch of Oregon Gulch through the Ranch, up to a bedrock section on adjacent BLM land approximately a mile upstream from the mouth. Apparently, the small fish move down into Jenny Creek before Oregon Gulch dries up in May or June, but some are stranded in small pools.

Benthic macroinvertebrates in Jenny Creek were sampled at both the north and south boundaries of the Ranch in October, 1995. The majority of the fauna present are widespread and common in western North America, and typically associated with mid-order streams. However, the Box-O Ranch samples have a mixture of montane and basin stream fauna. Sensitive, threatened and endangered, rare, and small stream-associated taxa were absent from the samples. Many of the long-lived taxa found were tolerant ones (e.g. snails and dragonfly larvae). The lack of these biota indicates that water temperatures are generally unsupportive of salmonids. Tolerant invertebrate abundance is high to very high, and richness is very high. Total bioassessment scores declined 3-10 percent in the various habitat types between the upstream and downstream sites, indicating that the Ranch has had a negative impact on biotic/habitat integrity. Conditions on the Ranch are detrimental to the survival of the more cold water-dependent species.

The degraded condition of the Jenny Creek channel on the Ranch was discussed in the previous sections. The quality of habitat for fish and other aquatic organisms reflects this condition. The 2.5 mile section of Jenny Creek on the Ranch has been extensively channelized and lacks shading, natural meander, a desirable pool/riffle ratio, course woody debris and suitable spawning gravel. These factors, coupled with low summer flows and warm water temperatures seriously impair growth, reproduction and survival potential for most aquatic organisms. Improvements in any of these factors can have positive effects on the health of aquatic resources.

A 1995 stream survey highlighted the difference in available fish habitat between a section of the creek that has been heavily impacted by channelization and ranch management, and the most downstream section, which remains in a more "natural" condition. The impacted section was wide and shallow. Deep pool areas (important for both suckers and trout) provided only a small amount of habitat. These pools also contained high amounts of fine sediments and bedrock, both of which prevent a pool from providing good winter habitat. Trout, dace, and suckers were present in this impacted section, but they were concentrated in the best habitat areas. Trout were in very low numbers. Conversely, the "more natural" section (near Oregon Gulch) had more riparian vegetation, a better diversity of habitat types, including many pools of different shapes and sizes, and low amounts of fine sediments. Not surprisingly, this section had many fish, especially trout and suckers.

Soils

The Box-O Ranch is located on canyon/alluvial land and adjacent southeast slopes of Rosebud Mountain, as indicated on the Soil/Geology Map [Map 4 of Jenny Creek Watershed Assessment and Analysis (JCWAA),USDI, 1995b].

The canyon/alluvial land consists of the Jenny Creek floodplain, adjacent terraces, and the canyon slope that drops down from the Pliocene/Pleistocene (High Cascade volcanic) flow plateau to the east of the Ranch. The canyon slope occurs in the tertiary Western Cascade series that is otherwise located to the west of Jenny Creek. This may be due to the ancestral Jenny Creek stream cutting near the contact between High Cascade and the underlying, older, tertiary Western Cascade series which would expose the Western Cascade series. Canyon slopes are only 30 to 50 percent on the Box-O Ranch. Alluvial land is highly variable with coarse textured soils typical of a floodplain, elevated stream terraces, and elevated bench terraces with thin gravelly alluvial soils over resistant Western Cascade rock. The bench terraces occur east of Jenny Creek in section 27.

Medford gravelly substratum is one soil that occurs in the alluvial land. Floodplain soils and bench terrace soils (soils shallow to bedrock) are two examples of other soils that occur on alluvial land on the Ranch. The JCWAA identifies the following soils that occur on the Box-O Ranch as fragile; Skookum, McNull, and Carney. Both Skookum and McNull occur with other stable soils such as McMullen. These fragile soils should be considered as high priority for restoration projects where "surface disturbance, concentrated runoff, and/or bare soil conditions are evident". The JCWAA recommends that "there should be no new road construction on fragile soils". Inactive slide deposits have been mapped on the southeast slopes of Rosebud Mountain down to the alluvial land of Jenny Creek (north of Oregon Gulch). This is the area where the Carney clay and the Skookum very cobbly loam occur. This area deserves special attention concerning restoration and any management activity that may reactivate movement.

Minerals

The lands that make up the Box-O Ranch were conveyed out of federal ownership in seven different actions that included homesteads, exchanges, and a railroad grant. This occurred between 1889 and 1944. Except for a stock-raising homestead in the west half of Section 28, the mineral estate was conveyed with the surface in these actions. When the lands were acquired through exchange, the mineral estate was included.

Information contained in the RMP identifies the area as having a moderate potential for locatable and leasable minerals and also geothermal energy. An oil and gas lease conveying the public lands surrounding the Box-O Ranch was issued to Husky Oil Company on July 1, 1982. No exploration activities were conducted and the lease was terminated on July 1, 1987. There has been no interest in the lands since that time.

The Box-O Ranch is currently open to mining location under the 1872 Mining Law, which means it is open to "prospecting, mining or processing operations, and uses reasonably incident thereto." However, if the Jenny Creek corridor on the Ranch is designated as an ACEC, an approved plan of operations would be required prior to any activity other than "casual use." Casual use is defined as "activities ordinarily resulting in only negligible disturbance." Generally, this covers activities that do not involve the use of mechanized earth moving equipment or explosives, or do not involve the use of motorized vehicles in areas designated as closed to vehicle access.

Plant Communities

According to Franklin and Dyrness (1988), the area of the Box-O Ranch is mapped and designated as the Ponderosa Pine Zone within the Forested Region vegetation grouping. However, the plant communities on the Ranch appear to be a gradient of ecosystems, or an ecocline, between the ponderosa pine zone and various zones within the Interior Valleys of Western Oregon vegetation grouping. Vegetation on the Ranch more appropriately meets the descriptions of Oak Woodlands, Conifer Forests, and Sclerophyllous Shrub Communities zones of the Interior Valleys grouping. Plant species of the ponderosa pine zone (ponderosa pine, western juniper, and antelope bitterbush) seem to blend into the Interior Valleys plant communities. There are even oak woodlands on the Ranch which have plant communities similar to oak woodlands in the Willamette Valley. The unique mixture and arrangement of plant communities on the Ranch are the result of a complex-gradient (assemblage of environmental factors; elevation, rainfall, nine different soil series, and aspect). Atzet (1994) also states that vegetation has been migrating into the area over the last 60 million years from six different directions, and the resulting plant communities are a result of time and the unique geology of the area.

White oak is the predominant tree species on the Ranch, and the oak woodlands vary by seral stage, species composition, and the arrangement of species. On a few ridges with a northeast aspect and on one ridge with a southeast aspect, an oak woodland plant community was found that occurs in the Willamette Valley: Garry oak (*Quercus garryana*)/Saskatoon serviceberry (*Amelanchier alnifolia*)/common snowberry (*Sympharicarpos albus*). Canopy closure is essentially complete (high density of small diameter oak stems) and Piper's Oregon grape (*Berberis piperiana*), and blue wild-rye (*Elymus glaucus*), are also prevalent in this community.

On southwest to west aspects, oak woodland savannahs occur with Garry oak as the predominant species. Canopy closure is partial to very open, the trees tend to be shorter in height, and ponderosa pine, western juniper, and wedgeleaf ceanothus are scattered throughout. Grasses predominate the ground cover layer.

North of Oregon Gulch on some ridges with a more favorable northeast aspect, a layer of conifer trees overtop the white oak woodlands. Ponderosa pine, sugar pine, and incense cedar compose the co-dominant and dominant crown classes. The oak trees tend to be seedlings through poles in size and are less abundant than the conifer species.

As the soils become rocky and more shallow, there is a transition from oak woodlands to Sclerophyllous Shrub Communities, and as the soils become more shallow, wedgeleaf ceanothus and grasses become more abundant. Western juniper and ponderosa pine trees are scattered throughout the landscape. Some dense patches of wedgeleaf ceanothus exist near ridge tops.

There are only three soil series on the Ranch that are capable of growing commercial forest lands; Greystoke, McNull, and Pinehurst, and these soils are probably found on less than 25 percent of the Ranch's land base. The conifer forest description for the Interior Valley vegetation grouping meets that given by Franklin and Dyrness (1988). There is an overstory tree layer of Douglas-fir, ponderosa pine, and sugar pine. Intermediate and suppressed crown class tree species are Garry oak and California black oak, *Quercus kelloggii*. Understory shrub species include baldhip rose (*Rosa gymnocarpa*), Piper's Oregongrape, common snowberry, and Saskatoon serviceberry. Deerbrush ceanothus seems to be found in open areas where the soil was disturbed. For the McNull soil series, the site index (50-year base) for Douglas-fir is supposed to be 80. One dominant Douglas-fir sampled showed a site index of only 57 for this soil series. (This high site index rating for the soil in the Ranch area may be overrated.)

Franklin and Dyrness (1988) state, "*Quercus garryana* is associated only on the east slopes of the Cascades in northern Oregon and southern and central Washington. At some locations there is an ecotonal belt of *Quercus garryana* between *Pinus ponderosa* forest and steppe (grasslands and shrublands)". As stated previously, this ecocline on the Ranch appears to be between the ponderosa pine zone and their description of Interior Valley plant communities. Like Garry oak, ponderosa pine is widespread across the landscape. Western juniper is also widespread through the plant communities. Antelope bush (*Purshia tridentata*) is also present which is associated with ponderosa pine zone plant communities. Ponderosa pine savannahs can also be found on the Ranch. Grass species predominate the understory vegetation. Snowberry species are also common in the understory which may indicate cold soil temperatures during the winter months. (Evidence of soil frost heaving was noted in open areas.)

Within the forest stands species composition shifts are evident. Most importantly, in the predominantly ponderosa pine/sugar pine stands, Douglas-fir regeneration is becoming prevalent in the understory at high stocking levels, a trend that should not be allowed to continue. Douglas-fir was even noticed in the understory of some oak woodlands. On a south slope, Douglas-fir was dying out of the overstory leaving the oak trees to predominate. Deerbrush ceanothus is occupying openings across the landscape and will probably invade openings in the future. The apparent lack of large scale disturbance is probably causing the abundance of native grass species to decline.

The majority of the vegetation communities are in a late seral stage. In the forest stands, it appears that the last stand replacement fire occurred approximately 124 to 139 years ago based on a small sample size of tree corings. Lack of fire has created dense stands of white oak with multiple stems. As a result individual stems have small diameters and small live crown ratios. It appears as though these multiple stemmed clumps of white oak are not producing mast crops whereas the large diameter, single stem oak trees are. The majority of the wedgeleaf ceanothus bushes are late seral in development. Only infrequent, small openings were observed across the landscape where early seral stage vegetation is found. These were openings created by selection logging, tree mortality, or perhaps small scale ground fires.

Because of the lack of large scale disturbance vegetation densities are high. Forest stand vigor is decreasing and dominant conifer trees are growing approximately 0.80 inches in diameter every 10 years. Forest stands have 160 to 240 ft^2 basal area per acre (BA/AC) and stand relative densities are probably above the point of imminent mortality and suppression. The scattered patches of ponderosa pine found across the landscape also appear to be overstocked. On the noncommercial soil series, pine densities should probably range from 40 to 100 ft^2 BA/AC to maintain vigorous tree growth. At one sample location there was 220 ft^2 BA/AC of western juniper, Garry oak, and ponderosa pine.

Because of the high vegetation densities and the decline of tree vigor, bark beetles are killing some trees. The western pine beetle (*Dendroctonus brevicomis*) was identified in dead ponderosa and sugar pine trees. It appeared as though the western pine beetle was killing more sugar pine than white pine blister rust (*Cronartium ribicola*). Blister rust spores were found growing on *Ribes* species. On one south slope, all of the Douglas-fir trees were dead. The Douglas-fir bark beetle may have been the cause of their demise. Western dwarf mistletoe (*Arceuthobium campylopodum*) is prevalent in some of the ponderosa pine stands. The mistletoe had already spread to the natural regeneration below. This disease could have a significant impact because it slows tree growth even more and eventually results in tree mortality.

Special Status Plants

Surveys for sensitive plants on the Box-O Ranch have turned up many populations of *Calochortus greenei*, a Bureau Sensitive Species. Also noted was *Lonicera interrupta*, a BLM tracking species.

Calochortus greenei is a narrow endemic, found only in a small area of Jackson County, Oregon and Shasta County, California. On the Box-O Ranch it is typically found in early seral stage oak woodland/savanna community. Here the overstory is widely scattered clusters or individuals of predominantly *Quercus garryana*, and is associated with *Pinus ponderosa* and *Juniperus occidentalis*. The understory is composed of an open shrub layer of mostly *Ceanothus cuneatus* and various perennial grasses. This plant exhibits low reproductive success rates which is exacerbated by livestock and wildlife grazing. The Medford District's RMP states that federal candidate species and their habitats will be managed for conservation so as not to contribute to the need to list and to contribute to the recovery of the species.

Lonicera interrupta is most commonly found on the Ranch under a canopy of stunted *Quercus garryana* and *Pseudotsuga menziesii*. Groups of this type are scattered throughout the oak woodland/savanna community. As a BLM tracking species, the District is encouraged to collect data in order to determine whether or not to include it as a special status species and as such does not require special management consideration.

Fire History

The history of fire on the Box-O Ranch indicates that a stand replacement fire burned through the area approximately 200 years ago. Evidence of this can be found in the white oak (6-10 inches in diameter) which is present on the Ranch. These oaks sprouted from the stumps of the previous white oaks which were killed in this fire. The age of large ponderosa pine on the Ranch range from 114 to 120 years. This is evidence that another stand replacement fire burned through the area approximately 125 years ago. The white oak which are present survived this fire.

Old fire scars on ponderosa pine indicate that a fire burned through the Oregon Gulch portion of the Box-O Ranch approximately 40 to 45 years ago. It is difficult to determine how widespread this fire was in terms of how much of the Ranch was burned by this fire. White oak in the four to six-inch diameter class and Douglas-fir in the eight-inch diameter class were established after this fire. They range from 34 years to 40 years in age.

Fire in the Jenny Creek Watershed, in which the Box-O Ranch is located, has a low frequency. Events occur on an average of less than 30 years apart.

Based on the fire occurrence of the area and when the last fire burned through the Ranch, it appears that the vegetation types, with the exception of exotic species, are fairly close to what existed during natural fire occurrence periods and before the advent of fire suppression.

For the majority of the Ranch, the fire hazard is low because a lack of fuel. Pine stands have a moderate hazard level because of duff, needles and understory limbs. The risk of a fire starting on the Ranch appears to be low to moderate because of the lightning frequency. Under normal conditions, a wildfire would burn in a mosaic pattern. Fire intensity would be moderate in the pine-white oak stands with some stand replacement and a lot of individual tree torching. The majority of the brush component on the Ranch has a dead fuel component ranging from 30 to 60 percent. Fuel models have been developed to predict the rate of spread, flame length, and resistance to fire control.

Biological Diversity/Ecosystem Health

The Box-O Ranch was reportedly homesteaded in 1899, and since then, human activity has had dramatic affects on the natural ecosystem. Fire suppression and logging have had separate influences on the conifer and shrub/oak habitats. Because of these factors, old growth conifers have been replaced by younger seral stages. Old healthy oak trees are few, while old, clumps of oak sprouts make up the majority of the hardwood component. The early and mid-seral stands generally have fewer snags and less coarse woody debris than are found in natural stands. Bark beetle outbreaks are now beginning to increase the number of snags in forest stands.

The damages inflicted to the riparian habitat by heavy livestock grazing, timber harvest, and stream channelization are the most dramatic of the ecosystem problems on the Ranch, and may be the most challenging to correct. It would be difficult to ascertain how extensive the riparian areas were in comparison with the meadows on much of the Ranch, or precisely what the vegetative composition may have been. Aerial photos from1939 do, however, give us a good look at two portions of the Ranch which have apparently non-impacted vegetation that is much older than any settlement of the Ranch. These photos show a continuation of the same vegetation patterns as exist in the uplands, continuing down to the edge of flood-prone areas, at which point riparian vegetation becomes dominant. No analysis has been done to determine if all of the species of the past ecosystem are still available. Some vegetative components, such as camas, could have been destroyed or displaced by domestic grasses and forbs. Added to this are the invading plant species, such as yellow starthistle and medusahead which may prove difficult to control.

Functional diversity has been greatly simplified in the riparian ecosystem. A wide floodplain which captured sediment and debris has been replaced by a deeply incised channel that transports sediment through the Ranch rather than depositing it on the floodplain. What had historically been a slower moving stream channel with natural sinuosity is now straightened so as to expedite drainage.

It is assumed that most of the species that made up wildlife diversity when the Ranch was homesteaded in the late 1800's still occupy this property today. Two outstanding exceptions are the grizzly bear and wolf. Beavers, otters and water birds that took advantage of beaver ponds, of course, are reduced. And no one knows the aquatic ecosystem well enough to say if any mollusks or aquatic insects have been extirpated.

Wildlife

The Box-O Ranch is located in a biologically diverse area where one can find both "east side" species such as magpies and "west side" species such as rough-skinned newts and spotted owls. The JCWAA states that there are approximately 225 species of terrestrial wildlife in the Jenny Creek Watershed. Discounting the variety of waterbirds on Hyatt Lake and Howard Prairie Reservoir and some species that prefer higher elevations, it is safe to assume that around 200 species are residents or occasional visitors on the Box-O Ranch. Extensive surveys for sensitive species and other wildlife have not been conducted. Most of what is known about the wildlife on the Ranch is the result of incidental sightings by BLM personnel while working on the Ranch, however some mist netting for bats has been done.

The Box-O Ranch serves as deer and elk winter range for migratory herds in the southwest corner of Klamath County and southeast corner of Jackson County. Part of the Jenny Creek Watershed, including the federal lands surrounding the Box-O Ranch, is designated as an elk management area and a critical deer winter range in the Medford District RMP.

The Box-O Ranch falls within the realm of two State game management units. South of highway 66, Copco Road is the dividing line between the Rogue and Keno Big Game Management Units. This places the Ranch just about on the line between the two units. It is almost certain that deer and elk from both units use the Ranch in winter and early spring. Radio collared elk from the Keno Unit have been located in the Rosebud Mountain area immediately west of the Ranch. None of the radio collared elk from the Rogue Unit have been located in the area. However, the collared elk from the Rogue Unit have not been monitored consistently throughout the winter.

A owner of a neighboring ranch reported that between 75 and 80 elk were seen on the Box-O Ranch in late February 1996. Aerial counts conducted by Oregon Department of Fish and Wildlife (ODFW) biologists later that year found about 100 head of elk on the east face of Rosebud Mountain. Which unit these animals came from is not known and is probably not very ecologically important. However, the presence of elk in these numbers indicates that the Ranch is an important winter range landscape feature for elk.

The Rogue District office of ODFW administers the Rogue Unit, and has set a herd goal of approximately 100 head for the elk herd that winters in the Keene Creek Ridge area generally west of the Ranch. The State biologists feel that, although the winter range in this area is shared by both deer and elk, management for deer is a higher priority than for elk (Thiebes 1995). It seems that if elk and deer are competing for resources on the winter range, deer should be given a larger allocation.

The Klamath Falls ODFW office which administers the Keno Unit has set an elk herd goal of 700 animals, but management of this herd will be programmed so that no detriment to the interstate deer herd occurs (R Anglin, Klamath District, ODFW, pers comm 1995).

The southeast corner of the Keno Unit contains the Pokegama Cooperative Road Closure Area which is immediately east of the Box-O Ranch across Copco Road. This area was established through a cooperative agreement between ODFW, Klamath Falls

RA BLM, Weyerhaeuser Timber Company (now U.S. Timberlands Services Company), and ten other agencies and sportsman organizations for the purpose of protecting wintering elk and deer from poaching and harassment. The utility of the Ranch as deer and elk winter range is dependent on the Ranch's ability to provide quality forage, thermal cover and security from human harassment.

The availability of upland forage for elk appears to be adequate for the number of animals presently attracted to the Ranch and vicinity. Idaho fescue is an important winter feed for at least elk, and may be important to deer at some times of the year. This grass occurs in the uplands, and could be a major reason why elk seem to congregate there at times. The succulent grasses and forbs available in spring and fall green-ups are very important forage for both deer and elk as they go into and come out of winter.

Much of the upland acreage on the Ranch is in a grass/brush condition that is typical of winter range conditions in this region. Wedgeleaf ceanothus and antelope bitterbrush are the primary mid-winter forage sources for deer. These plants are used heavily between fall and spring green up of the annual grasses and forbs.

Wedgeleaf ceanothus is the most common brush species. The wedgeleaf stands on the Ranch appear to be in good condition in terms of their usefulness to deer. None of the bushes exhibit the classic hourglass shape indicative of a bush growing tall enough to be out of reach of browsers. Sufficient space occurs between individual bushes for deer to move around in the stands, and the bushes are generally high enough to provide some visual screening from predators and hunters. Bushes are well rounded in shape and appear to be browsed heavily during winter.

Acorn mast, which is a high protein item for deer and at times for elk, is variable in quantity from year to year and from place to place in southwestern Oregon. In the fall, deer are drawn to areas with good mast crops where they then gorge themselves in preparation for the winter. The multiple stemmed clumps of white oaks, so prevalent on the Box-O Ranch, most likely provide less than quality forage (see Plant Communities section).

Elk are also attracted to the bottomland pastures where they graze on a combination of native and non-native grasses (see Livestock Grazing section). There are several unknowns concerning elk and deer winter use of the area before specific forage management objectives can be developed.

Pastures on the south end of the Ranch have become infested with yellow starthistle which is out-competing native and non-native grasses, replacing them entirely in some areas. This weed is also spreading up slope from the pasture areas and along the roads and irrigation ditches. It is of no forage value for wildlife. If it is not checked, this exotic weed will surely reduce available forage over time. (see Weeds section)

The mixed ponderosa pine and Douglas-fir groves serve as thermal and hiding cover for the deer and elk. The overall importance of cover on the Ranch has not been assessed at this time. Big game trails leading away from the Ranch to higher elevations in the west and east give the impression that most of these animals, especially the elk, are seeking cover elsewhere.

The Ranch has been in private ownership since the area was settled, and has not generally been open to the public. Harassment of wintering deer and elk has been largely limited to activities associated with the cattle operation. No regular, full-time occupation of the Ranch by humans has occurred for the past 20 years; therefore, winter use by big game has probably been met with little interference.

Other Wildlife, including Special Status Species

There is a diversity of habitats on the Box-O Ranch that meet all or at least part of the needs of a large variety of wildlife. These habitats are found in the streams, riparian, oak savannahs, brush fields, and forested slopes. Even the abandoned structures have some value for wildlife. The old Miller Ranch house at the south end is used by nesting barn swallows, and has some potential as a bat roost. California ground squirrels and various reptiles, including rattlesnakes appear to be common in and around the abandoned structures and debris piles, and it is probable that ringtail also use the old buildings. Waterfowl, mostly mallards and woodducks, have been seen on the Ranch regularly and mallards are known to be reproducing there. Some shore birds, such as the spotted sandpiper, are also attracted to the stream corridor, and beaver activity has been noted.

While habitat requirements are met for many species, the needs of other species are not now being met, or are met poorly. Downed woody debris and snags are scattered in the uplands, but their quality and quantity for use as wildlife habitat has not yet been assessed. It appears, however, that large diameter snag habitat, greater than 16 inches dbh, is lacking because of past logging activity and fire. By the same token, it is apparent that old growth dependent species have better opportunities away from the Ranch where soils and growing conditions are better suited to growing large conifers, and where past logging and fire have not altered stand conditions. Riparian habitat, as discussed earlier, is lacking throughout most of the 2.5 mile Jenny Creek corridor, so foraging and reproducing opportunities for those species preferring this habitat are not available.

Wildlife food is available on the Ranch in a variety of forms including berries, acorns, fir and pine cones, grass and insects. During the summer, an abundance of grasshoppers appear, especially in the pasture areas. These insects are consumed by many species of birds, including blue and ruffed grouse, turkey, bluebirds, magpies, and jays. Reptiles, small mammals, amphibians, and fish also take advantage of the hordes. In July 1995 a flock of more than 50 ringbill gulls appeared on the Ranch and were also feeding on the grasshoppers. In the summer of 1996, this number increased to around 300 birds.

A deer carcass discovered under the floor of one of the barns on the south end of the Ranch appeared to be bear or cougar cache. A winter concentration of deer on the Ranch undoubtedly attracts large predators including cougar, bear, and coyotes. A worker on the Box D Ranch to the north of the Ranch reported that a cougar had killed two wild horses near the north end of the Box-O Ranch during the winter of 1995-96.

A number of Special Status species have been noted on the Ranch. Bald and golden eagles, osprey, and goshawks have been seen on the Ranch in recent years, but there is no indication that they are nesting on the property, or concentrating their foraging efforts there. One known goshawk nest site is located within one half mile of the north end of the Ranch.

Foothill yellow-legged frogs and Western pond turtles have been seen along Jenny Creek on the Ranch, and one California mountain king snake was observed near the north end of the Ranch.

Several species of bats known to occur in the Jenny Creek Watershed are listed as BLM Sensitive Species, and some are included as "Protection Buffer" species in the NWFP. The Ranch has high potential for providing habitat for several of these species. Trapping efforts on the Ranch have already revealed the presence of six species of bats. They are the long-eared myotis, Yuma myotis, little brown myotis, big brown bat, pallid bat and silver-haired bat.

A spotted owl pair resides in suitable habitat on BLM land in Section 21 northwest of the Box-O Ranch, and it is probable that older conifer stands on the west and north perimeters of the Ranch are used by these birds for foraging.

Wild Horses

Jenny Creek forms the western boundary of the 80,900-acre Pokegama Wild Horse Management Area (WHMA). BLM lands make up approximately 20 percent of the management area. The majority of wild horse activity occurs east of Copco Road. Responsibility for management of the Pokegama Wild Horse Management Area is assigned to the Klamath Falls Resource Area. Only 15 percent of the BLM land within the herd area is managed by the Medford District.

The Pokegama wild horse numbers are currently estimated at approximately 50 animals based upon annual surveys. An environmental assessment recently completed by the Lakeview District indicates plans for a herd reduction and maintenance of approximately 30 horses (B Lindsay, Klamath Fall RA BLM, pers comm 1995). A group of six to eight horses from the Pokegama herd were commonly seen along Copco road near Rattlesnake Springs, but these animals were trapped in 1996 and placed in the wild horse adoption program. None of the horses had been seen on Ranch lands.

Livestock Forage

An abbreviated range condition survey was conducted on the Box-O Ranch in the fall of 1970 by the Natural Resource Conservation Service (NRCS). This survey identified several native grass species, the more common being western fescue (*Festuca occidentalis*), Idaho fescue (*Festuca idahoensis*) and lemmon needlegrass (*Stipa lemmonii*). Medusahead and cheatgrass were also identified in trace amounts. The vigor of the key forage plants (usually Idaho or western fescue) was indicated as moderate or high with one exception. Antelope bitterbrush (*Purshia tridentata*) vigor was marked as low with a note stating that it was heavily browsed. In addition to Antelope bitterbrush other shrubs identified included Birchleaf mountain mahogany (*Cercocarpus betuloides*), deerbrush (*Ceanothus integerrimus*), gray rabbitbrush (*Chrysothamnus nauseosus*), Pacific serviceberry (*Amelanchier alnifolia*) and wedgeleaf ceanothus (*Ceanothus cuneatus*) Unadjusted Acres/Animal Unit Month (AUM) values ranged from two to 50 acres.

A systematic range survey has not recently been conducted on the Box-O Ranch. However, several days have been spent conducting other tasks and becoming familiar with the Ranch. Some generalized notes regarding species that are present as well as their condition were concurrently made. Native grass species present include bluebunch wheatgrass, Idaho fescue, western fescue, bottlebrush squirreltail, mountain brome, blue wildrye, lemmon needlegrass and annual fescue (*Vulpia spp.*). Non-native species include bulbous bluegrass, medusahead, softchess brome, Mediterranean barley (*Hordeum hystrix*), Kentucky bluegrass, Canada bluegrass, orchard grass, timothy, and cheatgrass.

Based upon the NRCS range site descriptions, the herbaceous vegetation in the Oak-Pine-Fescue and the Oak-Juniper-Fescue sites possesses a great deal of potential. In general it appears that range condition improves as distance from the roads and irrigated pasture increases. The obvious rationale for this scenario is that uniform livestock distribution has not been maintained and as a result the areas adjoining the irrigated pastures have been grazed more intensively. These areas would probably have received a greater degree of human disturbance as well. As a result, species such as bulbous bluegrass, medusahead and starthistle (*Centaurea solstitialis*) have become established. Areas further up slope, particularly north slopes, still maintain large amounts of Idaho fescue with minor amounts of mountain brome. There are also several "pockets" which maintain a strong bluebunch wheatgrass component.

Considering that the Box-O Ranch is within a Critical Deer Winter Range and an Elk Management Area, Idaho fescue and bluebunch wheatgrass are very important species to maintain in the uplands. Idaho fescue remains green much later in the fall than many native species and provides good quality forage even when cured. Bluebunch wheatgrass is also considered excellent forage even after growth ceases.

The Juniper scabland areas are typically the less productive areas, occurring on south slopes and/or areas of shallow soils. These are shrub-dominated communities with a large amount of wedgeleaf ceanothus and localized areas of antelope bitterbrush. Birchleaf mountain mahogany is also present but very limited in distribution. Due to their nutritional content, all of these shrubs are very important to wintering deer and elk.

The herbaceous community in the scabland areas is almost completely dominated by non-native species, primarily medusahead. Considering these areas typically have very low productivity, recovery is likely to be slow to nonexistent in contrast to the oak woodland areas.

Irrigation System/Water Rights

The irrigation system on the Box-O Ranch had evolved through several ownerships and was based upon surface withdrawal from Jenny Creek. The existing water rights were acquired from 1925 to 1955 and total 3.67 cfs (cubic feet per second). This water was sufficient to irrigate 332.5 acres. The Ranch also has water rights for 0.02 cfs for domestic use from two springs which originate on the Ranch. When in full hay production the Ranch was reported to require two full-time employees to irrigate the fields.

At the time of acquisition of the Ranch by BLM, the irrigation system consisted of two main feeder ditches which traversed the total length of the Ranch. These ditches are located above the fields on both the east and west side of Jenny Creek.

The eastern ditch system includes a low concrete dam across Jenny Creek and a gate structure. The fields are irrigated by opening gates scattered along the ditch which in turn gravity fed water to spreader ditches at the upper portion of each field. The location of lateral and turn-out gates was dependent upon the contour and grade of the fields. The diversion dam and about 100 yards of the ditch, are located on property owned by the Box D Ranch, and about a half mile section is on land owned by U. S. Timberlands Services.

Water was diverted into the western ditch system through the placement of a rock dam across Jenny Creek. Water for irrigation was sent into the fields using a series of canvas dams. About a quarter mile section of the ditch is on U. S. Timberlands Services property.

The irrigation system was susceptible to adverse weather conditions. The interception of intermittent drainages has, in past years, accumulated water from storms and caused breaches in the ditch. High spring flows in Jenny Creek may also caused accumulation of sediment at the diversions which required periodic cleaning. The January 1997 storm resulted in ditch bank failures in both irrigation ditches, and the rock diversion dam for the west side ditch was swept away.

Maintenance cleaning on much of the upper portion of the east ditch was completed in the summer of 1995. Also in 1995, drain rock and 400 feet of 12 inch drain pipe were installed in the ditch along the northern-most pasture to reduce the risk of unstable soil slumping into the ditch. An additional 300 feet of drain pipe was installed in the ditch in September 1997 to further reduce the risk of slumping.

BLM is proceeding with plans to transfer water rights on the Ranch to instream use to benefit aquatic resources. Both irrigation ditches have been breached at several locations to allow natural flow paths to continue across bottomland pastures to Jenny Creek.

Bottomland Pastures

An interview with Bob Miller, Sr. in 1993, revealed that the irrigated pastures of the Box-O Ranch were seeded to a mixture of orchard grass and timothy. Grass fields were productive with local estimates suggesting 1500 to 2000 pounds of forage production per acre. Mr. Miller also removed many of the willows and riparian vegetation in the early 1950's to prevent the capture of flood-borne debris. Jenny Creek was also channelized with earthen berms to protect the irrigated fields.

The irrigated pastures along Jenny Creek totaled in excess of 208 acres at the time of BLM acquisition. Other marginal sites were apparently irrigated in past years.

Currently, the pastures are in various degrees of forage production ranging from fair to extremely poor. These conditions were brought about by extended drought, lack of irrigation system maintenance and absentee ownership. Some of the upper fields have maintained fairly good crops of introduced grass species. The lower pasture has been lost to starthistle and will require intensive work to reclaim. The central fields are between the two extremes. Most pastures will require weed control to regain productivity and may also require re-seeding. (see Weed section)

In June 1996, BLM employees clipped twelve plots within the irrigated pastures to obtain an estimate of production. The irrigation system was not operating during that year, however, spring moisture was sufficient for good plant growth. Production ranged from 3,204 pounds to 8,232 pounds, air dried weight, on the clipped plots. The average of the plots was 6,000 pounds per acre, or three tons.

Livestock Grazing

Livestock grazing within the area of the Box-O Ranch has been continuous since the late 1800's. Two early ranches were combined into one large ranch in the early 1950's. Cattle typically grazed the Ranch properties in the early spring until they were moved to federal grazing leases for the summer.

In the earlier years hay was harvested from the irrigated pastures during the summer months and stored to feed livestock through the winter. Cattle would return to the Ranch in late fall and graze the irrigated fields and uplands until it was necessary to feed them hay. Hay and aftermath grazing of irrigated pastures would sustain the livestock until spring plant growth.

In recent years haying of the irrigated fields was not as practical as when owners lived on the Ranch. Cattle would graze the Ranch in the spring, move to federal grazing leases, and then return to the Ranch until snow began to fall in the early winter. They were then shipped to Ashland for the winter. In recent years, when the Ranch owner's cattle were on the Federal grazing allotment, outside cattle owners leased the summer grazing forage on the irrigated pastures.

Grazing leases have not been initiated for the Ranch since the BLM's acquisition of the property to ensure progress toward restoration of riparian habitat. Trespass cattle has been an ongoing problem due to vandalism to perimeter fences and gates left open by Ranch visitors .

Fencing/Livestock Handling Facilities

As a working ranch the Box-O Ranch had an extensive system of improvements for handling and controlling livestock. The entire exterior of the Ranch is fenced to prevent drift onto the irrigated pasture from range livestock. In addition, interior fencing created seven irrigated pastures and additional upland pastures.

When the BLM acquired the Ranch the perimeter fences were in need of considerable maintenance. By 1998, all of the 7.75 miles of perimeter fence had been replaced with a combination of barbed and high tensile wire. Gates have been provided at intervals to allow easy access for wintering deer and elk. Most of the interior fences are in very poor condition. Major maintenance was completed by a Jobs-in-the-Woods crew in 1995 to help protect the irrigated pastures.

Four corrals are present on the Ranch. These include the large working corral at the old ranch headquarters, a small corral and loading chute near Copco road, and two small catch corrals; one at Oregon Gulch and one along the west side ditch. Each of these will require maintenance for future use.

Noxious weeds

The pastures on the Box-O Ranch are a mixture of grass, forbs, and various weed species. Starthistle, the most common weed, is spreading up the slope from the pasture areas and along the roads and irrigation ditches. This weed is a fierce competitor with plants of higher forage quality. The ratio of thistle to grass and forbs seems to vary from place to place on the pastures depending on degree of irrigation and soil disturbance. Wetter sites have less starthistle.

In addition to yellow starthistle, ranch fields have infestations of other common weedy species, including medusahead, Canada thistle, chicory, hedgehog dogtail, Dyer's woad and China lettuce. Once pastures become dominated by these weedy species, reclamation efforts become more challenging.

Cultural Resources

For at least 10,000 years people have come from the east, west, and south to the upland meadows and glades of the Jenny Creek Watershed. One of the earliest types of artifacts found in southwest Oregon comes from this watershed, attesting to the use of this area at the end of the last Ice Age. The archaeological record for this region documents the use of this area by Native Americans for many thousands of years, and by settlers for over a hundred years.

A survey of the Box-O Ranch property conducted by Pomona College in the summer of 1995 located cultural resources within the Ranch. These resources have not been formally evaluated, but activities planned at the Box-O Ranch must take into account potential effects to any of these cultural resources.

Recreation

Previously, when the Box-O Ranch was in private ownership, there was no authorized public recreation, and no recreation developments or facilities were left by the previous owner. Major recreation uses of surrounding BLM and private lands are hunting, fishing, camping, off-highway vehicle travel, sightseeing, target shooting, mushroom gathering, hiking and horseback riding. These activities will be weighed against other primary uses in determining their suitability for inclusion in ranch management programs. Since the acquisition of the Ranch, public use of the property for angling, hunting and other uses has become commonplace.

Transportation

There are approximately 7.5 miles of existing roads on the Box-O Ranch, plus a half mile of road accessing the Ranch from Copco Road. These roads were constructed primarily to manage and operate the Ranch. The longest roads, 40S-4E-27.3 and 33.0, follow the irrigation ditches that skirt the bottom lands on the east and west sides of Jenny Creek. Two roads branch off the east side road, 27.3, and access the uplands. In the past these roads were used for fence maintenance and logging. A similar road runs for a short distance off the Ranch on the southwest corner.

Ranch roads are natural surfaced, and are basically useable only during summer months. They varies from primitive jeep roads to roads with pit run material placed on short stretches. Several eroded sections on the west side road, 27.3, were rocked in 1996 paid for by a grant from the Governor's Watershed Enhancement Board.

Roads on the east and west sides of Jenny Creek are connected by four existing stream fords located at intervals in pasture areas. At one time a bridge existed just south of the cabin at the south end of the Ranch, but was presumably washed out by high water sometime between 1966 and 1975.

Ranch Buildings, Facilities and Equipment

Since 1899, when the Grieve brothers settled the Box-O Ranch and built a cabin somewhere on the northern end of the property, subsequent owners have constructed a number of buildings including dwellings, out buildings and barns. Some of the earlier structures burned or collapsed decades ago.

No one has lived on the Ranch for the past 20 years, and most of the remaining structures have lapsed into various states of disrepair. A rustic, semi-habitable, two-room cabin near the ford on the south end of the Ranch, and an equipment shed near the working corral at the center of the property, are exceptions. The equipment shed has been repaired and fitted with sliding doors and is currently being used to store equipment and materials. The cabin can be repaired and made useful without a great deal of expense. A large pole barn near the shed collapsed in a violent storm in the winter of 1994-95, and has since been cleaned up.

The original Louis Miller Ranch complex at the southern end on the property had several buildings that are well over 50 years old. The old Miller residence is a small, two-story dwelling. A small storage shed and a workshop are the only remaining out buildings. In their present condition these buildings probably constitute a public safely hazard. To the north of the house was a pole barn with a corrugated metal roof, and another pole barn was perched beside Oregon Gulch to the south of the house. Most of this barn had collapsed in the winter of 1997-98. In the process of burning the remnants of the collapsed barn in the fall of 1998, the fire escaped control and burned down the other pole barn and the small storage shed.

Two springs were developed at some point to supply water to the Grieve and Miller Ranches. Both water systems are in disrepair and water is no longer available to either ranch complex.

A variety of old farm equipment is scattered about the Ranch. Included are a hay rake, two sickle mowers, a hay loader, a plow and a ditcher. In addition, a number of abandoned cars, a five-yard dump truck, and a small travel trailer were hauled off the property for re-cycling in the fall of 1995. The remaining vehicles were taken away in 1997.

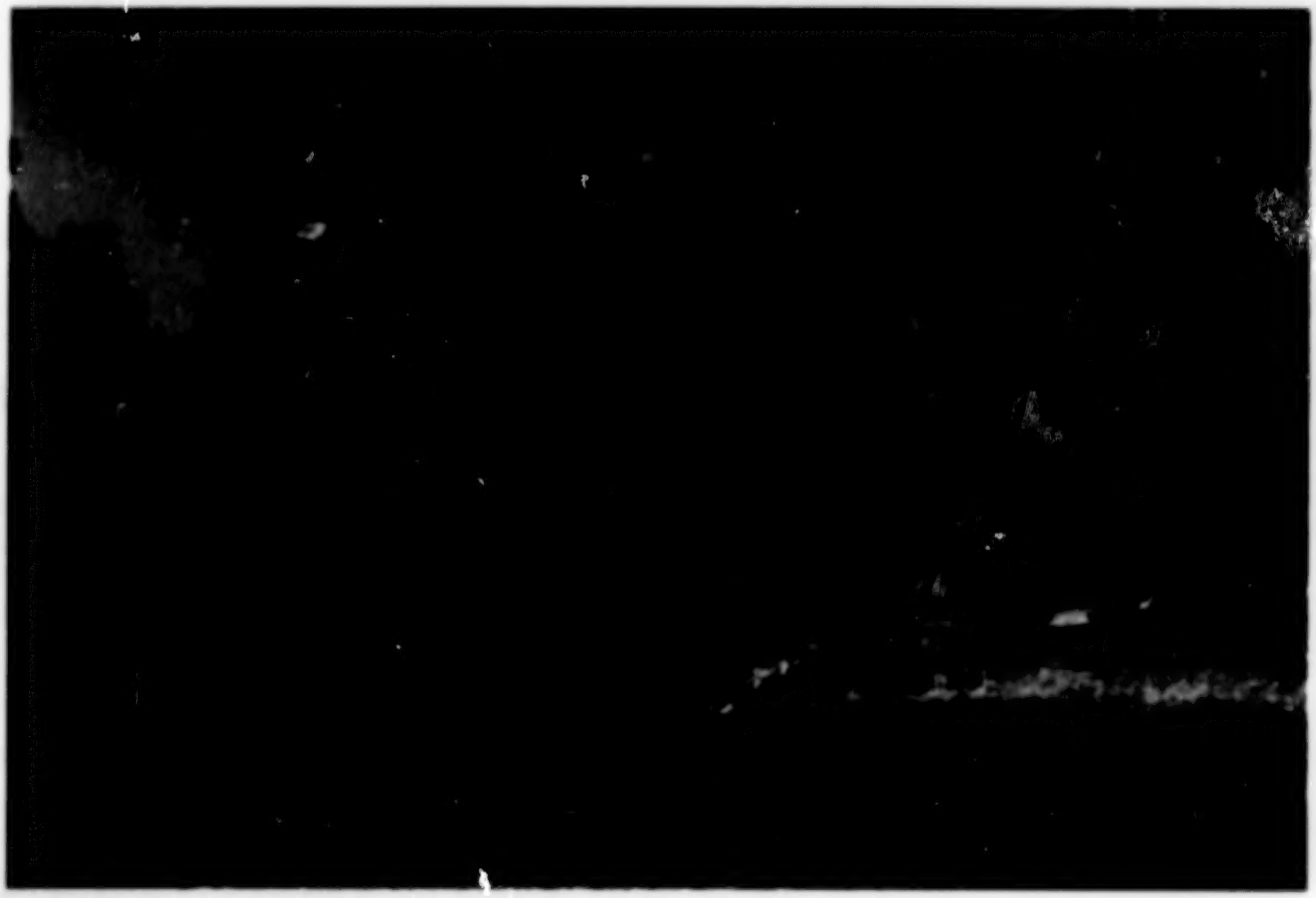
Social and Economic Issues

Future management plans for the Box-O Ranch must consider potential impacts to surrounding lands, especially to nearby neighbors. The BLM's acquisition of the property was met with local opposition. A petition from the Jenny Creek Private Lands Coalition was received in June 1993. It contained 39 names of neighbors and others concerned about Jenny Creek, and stated concerns about increased traffic on Highway 66 and Copco Road and increased fire risk, public trespass on private lands, and added federal restrictions. Whether these are real or perceived concerns, the BLM must include the public in the decision making process and attempt to minimize any potential impacts beyond the borders of the Ranch.

The Ranch's closest neighbor is U. S. Timberlands Services Company which has lands abutting the Ranch on the north and east sides. The Taylor Ranch is located about a quarter of a mile south of the Ranch, and the Box D Ranch is about one half mile to the north. U. S. Timberlands Services Company allows public access on its lands for recreation use, and it is assumed that the company will continue to follow this policy. Public trespass onto the Taylor and Box D Ranches is a definite concern.

Right-of-Way agreements with neighbors are another concern. Portions of Ranch access roads are under a reciprocal right-of-way agreement with U. S. Timberlands Services Company. Also, portions of two irrigation ditches are on U. S. Timberlands Services Company lands, and are not covered by agreement. A portion of one of these ditches and a second diversion dam are located on the Box D Ranch, and are without a formal agreement. The ditches will not be maintained in the future so formal agreements may now be a mute point, but BLM is still interested in improving fish passage at the diversion dam, so an agreement for this work will need to be pursued.

Chapter 3 - Alternatives



Chapter 3 – Alternatives

This Draft Environmental Impact Statement (DEIS) addresses possible management direction which will be used to prepare the final Cascade Siskiyou Ecological Emphasis Area (CSEEA) management plan. Five CSEEA management alternatives, including a "no action" alternative, are described in this chapter. Alternatives B, C, D and E describe various ways activities would be managed in the CSEEA. Each alternative has a different emphasis, primarily defined in terms of resource focus, with the underlying premise to maintain, protect, restore or enhance relevant and important ecological and biological value(s).

The establishment of the CSEEA boundary is one of the major decisions that will be derived from this process. As a result of scoping, all of the Jenny Creek Late-Sucessional Reserve (LSR) was added to the area of consideration for the CSEEA. Although most alternatives only include portions of the Jenny Creek LSR, management direction for the entire LSR will be addressed in this DEIS consistent with the *Jenny Creek Late-Sucessional Reserve Assessment*.

This DEIS concerns the public lands in California that exist within or adjacent to the Klamath-Iron Gate, Cottonwood Creek and the Jenny Creek watersheds, particularly the lands adjacent to or that make up the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA indentified in Redding Resource Management Plan (1993). This DEIS will address only the boundary issues associated with these lands. Management activities on the Horseshoe Ranch Wildlife Area will continue to be guided by the *Horseshoe Ranch Habitat Management Plan* (DOI/BLM 1983). Management activities on the Jenny Creek ACEC/RNA will remain consistent with the *Redding Resource Management Plan*. Any change in management direction on these lands will be addressed by the Redding BLM Field Office in an forthcoming resource management plan amendment. A separate set of alternatives specific to the California BLM administered land boundary issues will be addressed in this chapter. The Redding Field Office will write a record of decision on these issues separate from the CSEEA in Oregon.

Oregon BLM Land Within the CSEEA Boundary of Consideration

Six designated land use areas are used in this DEIS as a basis of the analysis. Five of the land use designations come from the RMP and were based on resource values. The Box-O Ranch was not specifically addressed in the RMP and, as a result of it's unique resource values, is the sixth designated land use areas in this DEIS. The designated land use areas are:

1) Areas of Critical Environmental Concern (ACECs)
2) Research Natural Areas (RNAs)
3) Matrix lands
4) Wilderness Study Area (WSA)
5) Late Successional Reserve (LSR)
6) Box-O Ranch

ACECs include the Pilot Rock ACEC and the Jenny Creek ACEC. The Pilot Rock ACEC encompasses 544 acres and includes the Pilot Rock and Mariposa units. The Oregon Jenny Creek ACEC consists of 966 acres along the southeastern border of the CSEEA. Although each ACEC has its own unique values, they were joined for analysis purposes.

During the analysis, activities or issues specific to an each ACEC will be addressed under this general category.

RNAs include the Scotch Creek RNA and the Oregon Gulch RNA. The Scotch Creek RNA consist of 1,797 acres adjacent to the west side of the WSA in the lower reaches of Scotch Creek in Oregon. The Oregon Gulch RNA which encompasses approximately 1,047 acres is located in the southeastern portion of the CSEEA immediately west of the Box-O Ranch in the Jenny Creek watershed. Although each RNA has its own unique values, the areas were combined under the same category based on RNA management criteria. Each RNA will be addressed individually within the general RNA category during this analysis.

Matrix lands are all of the federal lands outside of the other five designated areas. Under the Medford District RMP, Matrix land is the area in which most of the timber harvest and other silvicultural activities will be conducted. The Matrix contains non-forested areas as well as forested areas that may be technically unsuited for timber production and will be managed for multiple-use purposes other than timber production. The Probable Sale Quantity (PSQ) for the BLM Medford District is calculated from the timber available for harvest from the Matrix land. Upon acquisition, the Box-O Ranch was included as Matrix land but because of its resource qualities and influence on Jenny Creek it is considered as a separate designated land use in this document.

The 5,867 acre Soda Mountain Wilderness Study Area (WSA) consist of the headwaters of the Dutch Oven Creek, Camp Creek and Salt Creek subwatersheds. The Soda Mountain WSA was recommended for wilderness designation by the Secretary of the Interior in 1991. The President, in turn, recommended it for designation to the Congress in 1991. To date no Congressional action has been taken on these recommendations, therefore, the area is managed under the BLM's *Interim Management Policy for Lands Under Wilderness Review*, H-8550-1(DOI, 1995) which outlines what must be done to insure that the Area's suitability for wilderness designation is not impaired by proposed activities. Until Congress acts on the President's recommendation for the Soda Mountain Wilderness Study Area, it is to be managed under the *Interim Management Policy For Lands Under Wilderness Review* and all management implications will be common to all alternatives.

The Jenny Creek Late-Successional Reserve (LSR) is located on public lands managed by the Bureau of Land Management (BLM) in southeastern Jackson County, Oregon in portions of Townships 39, 40, 41 South, Ranges 02, 03, 04 East (Willamette Meridian). The Jenny Creek LSR consist of 34,498 acres of public land. Late-Successional Reserves are intended to be a network of existing and potential late-successional forests that are designed to protect and enhance mature and old-growth forest ecosystems. The reserves are designed to serve a number of purposes. First, they are intended to provide a well-distributed quantity of quality old-growth forest habitat. Second, they are intended to provide habitat for populations of species that are associated with late-successional forests, which helps ensure that late-successional associated species will be conserved. Third, they provide potential connectivity to other LSRs in the region. The Jenny Creek LSR is one of the few places within the range of the northern spotted owl where relatively intact forested habitat bridges the gap between the coast mountain range and the interior mountain range(s) (Sierras and Cascades), and thus provides a high potential for east-west genetic exchange.

The 1,200 acre Box-O Ranch was acquired by the Bureau of Land Management in May 1995. The Medford District RMP does not provide direction on management of the Box-O Ranch as it was not in federal ownership at the time the Plan was prepared. An environmental assessment (EA), originally prepared in 1992 and amended in 1993, analyzed the impacts of exchanging 931 acres of BLM land in the Lake Creek drainage for the Box-O Ranch. The EA imposed several restrictions/closures on the Box-O Ranch pending the completion of a management plan. The preparers of the RMP anticipated that new lands might be acquired after the plan's adoption, and included a provision for them. The RMP (pg. 98) states "Newly acquired or administered lands or interests in lands will be managed for their highest potential or for the purpose for which they are acquired." It further states that "Lands acquired with no identified special values or management goals will be managed in the same manner as surrounding or comparable BLM-administered land." These statements provided the preparers of this management plan an opportunity to develop management direction for the Box-O Ranch that emphasizes its unique features and resources while meeting the broader intent of the RMP. A draft Box-O Ranch management plan was completed in 1997 and will be used as a basis for management direction in this document.

The designated land use areas will be used as geographical reference zones in all proposed alternatives in this plan. Designated land use areas identify portions of the CSEEA with specific resource values. In this context, all activities that may affect resource values within these designated land use areas will be analyzed. The Soda Mountain Wilderness Study Area (WSA) is managed according to the Interim Management Policy (IMP) and management of this area will not be analyzed any further in the document.

Proposed alternatives and management direction in this plan pertains only to BLM administered land within the CSEEA boundary. Management of private land adjacent to BLM administered land within the CSEEA will not be addressed in this document. Private land identified for possible future acquisition into the CSEEA would only occur if the owner is willing to sell or trade.

The alternatives vary in many aspects, but some procedures and actions will be the same in all of the alternatives. Rather than repeat the similar aspects in each alternative description, activities that are the same in all alternatives are summarized at the end if this chapter in the "Management Common to All Alternatives" section. Management common to all alternatives will be implemented under any alternative selected.

Rationale for the Preferred Alternative

The process of developing the alternatives and selecting the preferred alternative required consideration of various approaches in order to implement RMP direction, Federal Land and Policy Management Act (FLPMA), and other applicable mandates, as well as the various objectives. In identifying the preferred alternative, the CSEEA Planning Team determined that Alternative C most effectively accomplishes the overall objective of maintaining, protecting, restoring or enhancing the CSEEA resources, best addresses the diverse community and stakeholder concerns in a fair and equitable manner, and provides the most workable framework for future management of the CSEEA. Although many parts of the other alternatives would adequately meet the objectives of the CSEEA, the team felt that Alternative C provides the best foundation on which to build the plan.

The planning team recognizes that the selection of the preferred alternative resulted from qualitative judgement, and that those who are interested in the CSEEA's future management will have different perspectives on the issues addressed in this document. A significant purpose of this process is to facilitate public dialogue on those issues. The information from the public dialogue will be considered in the formulation of the final EIS Preferred Alternative.

Alternative A - (No Action)

Following the designation of the Cascade Siskiyou Ecological Emphasis Area (CSEEA) in the Medford District Resource Management Plan (RMP), management direction was established pending the completion of a management plan. The No Action Alternative would continue the present management approach, guided by the RMP and existing law and policy. The No Action Alternative is required by the National Environmental Policy Act (NEPA) and provides the baseline against which to compare the other alternatives.

In designating the CSEEA, the RMP directed that management would consider the four varied plant communities, two RNAs, two ACECs, special status plant and animal populations, crucial deer range for the interstate herd, and the outstanding recreation and scenic values. The Soda Mountain Wilderness Study Area (WSA) is managed according to the Interim Management Policy (IMP) and management of this area will not be addressed any further in the document.

Boundary Adjustments

No boundary adjustments are recommended in this alternative as the original boundary was set by the RMP. The boundary for Alternative A is displayed on map 39.

Grazing

Livestock grazing is allowed across all of the CSEEA. RMP provides for livestock grazing in an environmentally sensitive manner, consistent with management objectives (i.e. Aquatic Conservation Strategy) and land use allocations (i.e. LSR). The RMP also provides for rangeland improvement projects and management practices, consistent with management objectives and land use allocations. RMP management direction is given to adjust grazing practices that prevent attainment of the Aquatic Conservation Strategy (ACS) and riparian reserve objectives in riparian areas and LSRs. The Box-O Ranch was acquired near the completion of the RMP and is not specifically addressed in the document. The land use allocation for the Box-O Ranch is Matrix.

Timber

Matrix land is primarily managed to produce forest products and contribute toward the Medford District's probable sale quantity (PSQ). Prescribed fire, timber harvest, grazing and vegetation manipulation are available as management tools and applied as necessary to enhance or maintain desirable habitat conditions, vegetation species composition and structure of forest land in the matrix and LSR. The Jenny Creek LSR is managed for the protection, maintenance and enhancement of late-successional habitat. The RMP directs the preparation of a management assessment for the LSR which was prepared in 1999. Timber harvest in the LSR would not contribute toward the PSQ. The Box-O Ranch is currently in the Matrix land use allocation. The Oregon Gulch RNA, Jenny Creek ACEC and the Pilot Rock ACEC are not available for timber harvest under the RMP. Timber harvest could occur in the Scotch Creek RNA.

Transportation

The RMP objectives are to develop and maintain a transportation system that serves the needs of the users in an environmentally sound manner. Problems associated with high road density would be corrected by emphasizing the reduction of roads where those problems occur. (RMP pg 84). Management directions from the RMP that pertain to the CSEEA include:

- The attainment of the Aquatic Conservation Strategy (pg.22, RMP).
- Avoid special areas and special habitats.
- Minimize new construction in areas with fragile soils (pyroclastic)...
- Stabilize existing roads where they contribute to significant adverse affects on soils water and fisheries.
- Construct roads in the LSR(s) if potential benefits of silviculture, salvage, and other activities exceed the cost of habitat impairment.
- Reduce existing road mileage within key watersheds.
- Follow best management practices (in Appendix D of RMP)...to mitigate adverse effects on soils, water, fish, and riparian habitat during road construction and maintenance.
- Determine necessity of road systems to meet initial wildfire suppression objectives prior to any prepared closure or modification.

These are the main directives in the RMP that pertain to the transportation system, for all of the management directives refer to the RMP (pages 86 through 88).

The Best Management Practices for roads pertaining to this area includes:
- Use seasonal restrictions on all unsurfaced roads.
- Surface inadequately surfaced roads that are to be left open to traffic during wet weather.

Off -Highway Vehicle Use

Off-highway vehicle (OHV) use is permitted only on designated BLM roads in the CSEEA. OHVs are limited to administrative use only on the Box-O Ranch. Off-highway vehicle use is not permitted within the entire Pilot Rock ACEC (Pilot Rock and Mariposa units), or within RNAs. Off-highway vehicle use is permitted only on designated roads in the Jenny Creek ACEC. The Pacific Crest National Scenic Trail is closed to OHV use except for existing road crossings.

Hiking and Non-Motorized Recreation

Non-motorized recreation including hiking, backpacking, camping and picnicking is unrestricted across the CSEEA. These activities in the RNAs and ACECs must not interfere with the maintenance of the key characteristics of these areas.

Forest Health

The use of all silvicultural tools available to promote tree health and reduce risk of damaging events may be used on Matrix land and the Box-O Ranch. Only activities that promote the maintenance of key resource characteristics may be undertaken in the RNAs, and ACECs. Silvicultural tools to promote health in the LSR would be consistent with enhancing old-growth habitat while meeting LSR objectives.

Grass /Shrub/Woodland Community Health and Restoration

The use of all tools to maintain or enhance the health of the native shrub/grass communities is allowed on Matrix land and the Box-O Ranch. Activities in the Jenny Creek LSR must not interfere with the attainment of LSR objectives. Activities to maintain or enhance shrub/grass health could occur in the RNAs or ACEC as long as they do not interfere with the maintenance of the key characteristics in those areas.

Private Land Acquisitions

Land acquisitions resulting in land tenure adjustments for RNAs, ACECs or LSR would occur when opportunities to conserve biological diversity exist. BLM ownership in the Jenny Creek watershed would be consolidated, where possible, to improve watershed management. Land acquisitions for Matrix land and Box-O Ranch would occur when opportunities to conserve biological diversity exist or to enhance management opportunities. All land acquisition would be obtained from willing owners.

Special Forest Products

Special forest products are to be managed for production and sale when demand is present and where actions are consistent with primary objectives for the land use allocation. Principles of ecosystem management are to be used to guide the management and harvest of special forest products. There will be no harvesting of special forest products in ACECs, RNAs, designated wetlands, special status flora or fauna sites. Only limited harvesting will occur in special habitat sites, White oak woodlands sites, known cultural sites, fragile soils sites, LSRs, riparian reserves, or key watersheds.

Horse/Pack Stock Recreation

Horses and Pack Stock recreation is allowed in all designated land use areas but must not interfere with maintenance of key resource characteristics in the ACEC or RNA.

Minerals

The CSEEA is open for leaseable, locatable and saleable minerals for all designated land use areas except the ACECs and RNAs. Mineral leasing in the ACECs are subject to no surface occupancy. The RNAs are closed to leasable mineral, the area is recommended for withdrawal from locatable mineral entry, and common mineral sales are prohibited.

Facilities/Rights-of-Way

One RMP objective is to continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in the RMP. Another RMP objective is to ensure that all rights-of-way for hydroelectric developments are consistent with Northwest Power Planning Council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values. Land use allocation direction pertaining to the CSEEA are:

- Allocation of lands to existing rights-of-way corridors and communication sites will continue.

- Subject to valid existing rights and with the exception of buried lines in rights-of-way of existing roads, exclude rights-of-ways in the following areas:
  - Research natural areas
  - Wilderness study areas
  - Known special status plant species sites
- With the exception of buried lines in rights-of-way of existing roads, avoid rights-of-ways in the following areas:
  - Areas of environmental concerns
  - Sensitive species habitat

- Known wetlands
- Late-successional reserves

Rights-of-way may be granted in avoidance areas when no feasible alternate route or designated rights-of-way corridor is available.

The above provides a baseline of the current RMP management direction of the land use designated areas within the proposed boundary of the CSEEA. Alternative A would continue this baseline approach. It would also continue current levels of research, maintenance, access and other established uses consistent with the RMP. Table 3-1 summarizes activities that could occur in the CSEEA under Alternative A.

Table 3-1. Alternative A

ACEC's	RNA's	Matrix	LSR	Box-O
External CSEEA Boundary Adjustments				
• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments				
• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP	• No Adjustments to boundary described in Medford District RMP
Grazing				
• Allowed • Adjust grazing to meet ACS/riparian reserve objectives	• Allowed • Adjust grazing to meet ACS/riparian reserve objectives	• Allowed • Adjust grazing to meet ACS/riparian reserve objectives	• Allowed • Adjust grazing to meet ACS/riparian reserve objectives	• Allowed • Adjust grazing to meet ACS/riparian reserve objectives
Timber/PSQ				
• No timber harvest	• No timber harvest in Oregon Gulch RNA • Allowed in Scotch Creek RNA & contributes to PSQ	• Timber harvest on sustainable basis. • Contributes to PSQ	• Allowed only to meet LSR objectives • Does not contribute to PSQ	• Timber harvest on sustainable basis. • Contributes to PSQ
Transportation				
• Follow Best Mgt. Practices: -Surfaced roads that are open all year -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	• All roads are administratively closed	• Follow Best Mgt. Practices: -Surfaced roads that are open all year -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	• Follow Best Mgt. Practices: -Surfaced roads open all year. -Natural surface roads closed during wet season -decommission roads not needed for future mgt.	• Restricted to administrative use only • Closed Nov.15 to April 1 • Follow Best Mgt. Practices: -decommission roads not needed for future mgt.

Table 3-1. Alternative A

ACEC's	RNA's	Matrix	LSR	Box-O
Off-Highway Vehicle use				
• Pilot Rock ACEC closed to OHV use • Jenny Creek ACEC limited to designated roads	• Closed to OHV use	• Limited to designated roads	• Limited to designated roads	• Restricted to administrative use only • Closed Nov.15 to April 1
Hiking/Non-Motorized Recreation				
• Activities allowed that do not interfere with maintenance of key ACEC characteristics	• Activities allowed that do not interfere with maintenance of key RNA characteristics	• Activities allowed • Rebuild the historic Bean Cabin	• Activities allowed	• Activities allowed
Forest Health (Trees)				
• Activities allowed but only to promote maintenance of key ACEC characteristics	• Activities allowed but only to promote maintenance of key RNA characteristics	• Use all techniques available for restoration and reforestation	• Activities allowed only to meet LSR objectives	• Use all techniques available for restoration and reforestation
Grass/Shrubs/Woodland Communities Restoration Activities				
• Activities allowed but only to promote maintenance of key ACEC characteristics	• Activities allowed but only to promote maintenance of key RNA characteristics	• Use all techniques available for restoration	• Activities allowed only to meet LSR objectives	• Use all techniques available for restoration
Private Lands Acquisition				
• Make land tenure adjustments emphasizing opportunities that conserve biological diversity • Acquire land along Jenny Creek where possible	• Make land tenure adjustments emphasizing opportunities that conserve biological diversity	• Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	• Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	• Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities

Table 3-1. Alternative A

ACEC's	RNA's	Matrix	LSR	Box-O
Special Forest Products				
• Not Allowed	• Not Allowed	• Allowed	• Limited activities that must not interfere with attainment of LSR objectives	• Limited activities for personal use only allowed
Horse/ Pack Stock Recreation				
• Activities allowed that do not interfere with maintenance of key ACEC characteristics	• Activities allowed that do not interfere with maintenance of key RNA characteristics	• Activities allowed	• Activities allowed	• Activities allowed
Minerals Activities				
• Mineral leasing subject to no surface occupancy • Activities allowed but managed to promote maintenance of key ACEC characteristics	• Mineral leasing subject to no surface occupancy • Recommended for withdrawal from locatable mineral entry • Mineral sales are prohibited	• Open for leaseable, locatable and saleable minerals	• Open for leaseable, locatable and saleable minerals	• Open for leaseable, locatable and saleable minerals
Facilities/Rights-of-Way				
• Avoid rights-of-way in the following areas: - Areas of Environmental Concerns - Sensitive species habitat • Exclude rights-of-ways in the following areas: - Known special status plant species sites	• Exclude rights-of-ways in the Research Natural Areas	• Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans • Avoid rights-of-ways in the known wetlands	• Avoid rights-of-way in the Late-Successional Reserves	• Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans • Avoid rights-of-ways in the known wetlands

Alternative B

This alternative provides the highest sustainable commodity outputs, including forest products, livestock production, special forest products and other commodities while adequately accommodating ecological protection required by existing laws and regulations. In addition, Alternative B fully acknowledges the ecological values of the CSEEA and would emphasize them in the planning of management activities. Although, historically, timber extraction has been relatively low throughout the CSEEA, this alternative recognizes its potential importance as available timber supplies diminish elsewhere. Grazing, which has historically occurred at much higher levels would continue but would be managed to avoid adverse ecological impacts.

Boundary Adjustments

Habitat connectivity would be accommodated by the Jenny Creek LSR which is not be included in the CSEEA boundary under this alternative. Therefore, the RMP mapped connectivity corridors would not be included in this alternative (see map 40). The CSEEA boundary west of Interstate 5 would also be refined to exclude approximately 260 acres in the Cottonwood Creek drainage [Sections 19 and 20, T.40S.,R.02E. (Willamette Meridian)].

Grazing

Livestock grazing would be allowed across all of the CSEEA utilizing all areas to maximize livestock production. Grazing management strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts. Rangeland improvements such as water developments, corrals and fences would be carefully planned to be environmentally compatible with key characteristics of designated land use areas. The Box-O Ranch pastures would be utilized for livestock production.

Timber

Matrix and ACEC forests would be managed to produce forest products and would remain a component of the Medford District's probable sale quantity (PSQ). Prescribed fire, tree thinning, grazing and vegetation manipulation would all be available as management tools and applied as necessary to enhance or maintain desirable habitat conditions, vegetation species composition and structure.

Transportation

Transportation system designed for this alternative is similar to the Alternative A system with additions to adequately facilitate forest products harvest, grazing and active management consideration would be given for sensitive habitats and rare organisms. Existing roads would be maintained to their assigned maintenance level. When necessary for management or stabilization natural surface roads would be improved and surfaced, or blocked. Schoheim Road (41-2E-3.0, 41-2E-9B, and 41-2E-10.1), Pilot Rock Road (40-2E-33) and Skookum Creek Road (40-3E-27.2) would be improved and surfaced to facilitate proper drainage and extend seasonal use. If easements could be obtained, Randcore Pass Road (40-4E-19.2) would also be improved. The Soda Mountain communications site access road would be renovated to improve drainage and extend seasonal use. Roads would be constructed or improved to access matrix lands west of Interstate Highway 5 if easements could be obtained.

Off-Highway Vehicle Use (same as Alternative A)

Off-highway vehicle (OHV) use is permitted only on designated BLM roads in the CSEEA. OHVs are limited to administrative use only on the Box-O Ranch. Off-highway vehicle use is not permitted within the entire Pilot Rock ACEC (Pilot Rock and the Mariposa unit), or within RNAs. Off-highway vehicle use is permitted only on designated roads in the Jenny Creek ACEC.

Hiking/Non-Motorized Recreation

With the exception of the Scotch Creek and Oregon Gulch RNAs, where only hiking is permitted, non-motorized recreation including hiking, backpacking, camping and picnicking would be unrestricted.

Forest Health (Same as Alternative A).

The use of all silvicultural tools available to promote tree health and reduce risk of damaging events may be used on Matrix land and the Box-O Ranch. Only activities that promote the maintenance of key resource characteristics may be undertaken in the RNAs, and ACECs. Silvicultural tools to promote health in the LSR would be consistent with enhancing old-growth habitat while meeting LSR objectives.

Shrub/Grass Community Health and Restoration

The use of all tools would be available to maintain or enhance the health of the native shrub/grass communities. Activities in the Jenny Creek LSR would not interfere with the attainment of LSR objectives. Activities to maintain or enhance shrub/grass health could occur in the RNAs or ACECs as long as they do not interfere with the maintenance of the key characteristics in those areas.

Private Land Acquisitions

Private land acquisitions would not be pursued in Alternative B.

Special Forest Products

Special forest products are to be managed for the production and sale when demand is present and where actions taken would not interfere with the key resource values for the land use allocation. Principles of ecosystem management are to be used to guide the management and harvest of special forest products. There would harvesting of special forest products in ACECs, RNAs and LSRs but activities could not interfere with key resource characteristics.

Horse/Pack Stock Recreation (Same as Alternative A)

Horses and Pack Stock recreation is allowed in all designated land use areas but must not interfere with maintenance of key resource characteristics in the ACEC or RNA.

Minerals (Same as Alternative A)

The CSEEA is to open for leaseable, locatable and saleable minerals for all designated land use areas except the RNAs. The RNAs are closed to leasable mineral, the area is recommended for withdrawal from locatable mineral entry, and common mineral sales are prohibited.

Facilities/Rights-of-Way

Existing authorizations involving the Soda Mountain communication site would be continued and no restrictions on new communication site development would be imposed. The communication site access road would be improved to prevent erosion and maintained.

Table 3-2 summarizes activities that could occur in the CSEEA under Alternative B.

Table 3-2. Alternative B

ACEC's	RNA's	Matrix	LSR	Box-O
External CSEEA Boundary Adjustments				
• No adjustment	• No adjustment	• Eliminate RMP mapped connectivity corridor (map 40) • Exclude sections 19 and 20 in the Cottonwood drainage west of Interstate 5	• No adjustment	• No adjustment
Internal Boundary Adjustments				
• No adjustments	• No adjustments	• No adjustments	• No adjustments	• No adjustments
Grazing				
• Grazing permitted • Grazing strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts	• Grazing permitted • Grazing strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts	• Grazing permitted • Grazing strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts	• Grazing permitted • Grazing strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts	• Grazing permitted • Grazing strategies that utilize range capacity would be developed with an emphasis on minimizing negative ecological impacts
Timber/PSQ				
• Manage forest for timber but not to interfere with key characteristics • Contribute to PSQ commitment	• Timber harvest for scientific research or demonstration • No PSQ commitment	• Managed for timber production to contribute toward PSQ commitment	• Manage to meet LSR objectives (see LSR plan) • No PSQ commitment	• Manage as matrix to meet PSQ commitments

Table 3-2. Alternative B

ACEC's	RNA's	Matrix	LSR	Box-O
Transportation				
• Same as alternative A plus: • Improve and/or rock natural surface roads to Pilot Rock ACEC • Improve and maintain all existing roads	• Same as alternative A plus: • Block existing unencumbered roads	• Same as alternative A plus: • Improve and maintain all existing roads • Improve drainage to control erosion • Replace culverts to meet 100 year events • Improve roads to minimum haul standards needed for logging • Construct new roads as needed for management purposes • Improve, surface and maintain Schoheim road (41S-2E-3.0;-9B; -10.1) • Improve road to Soda Mtn. Communication site	• Same as alternative A plus: • Improve and maintain all existing roads • Improve drainage to control erosion • Replace culverts to meet 100 year events • Improve roads to minimum haul standards needed for logging • If easements are obtained: Improve, surface and maintain Randcore Pass road (40-4E-19.2) through Agate Flat to California; Skookum Creek road (40S-3E-27.2) and Schoheim road (41S-2E-10.1)	• Same as alternative A plus: • Improve and maintain all existing roads • Improve drainage to control erosion • Replace culverts to meet 100 year events
Off- Highway Vehicle Use (same as Alt.A)				
• Pilot Rock ACEC closed to OHV use • Jenny Creek ACEC limited to designated roads	• Closed to OHV use	• Limited to designated roads	• Limited to designated roads	• Restricted to administrative use only • Closed Nov.15 to April 1
Hiking/ Non-Motorized Recreation (same as alt. A)				
• Activities allowed that do not interfere with maintenance of key ACEC characteristics	• Activities allowed that do not interfere with maintenance of key RNA characteristics	• Activities allowed	• Activities allowed	• Activities allowed

Table 3-2. Alternative B

ACEC's	RNA's	Matrix	LSR	Box-O
Forest Health (Trees) (same as alt. A)				
• Activities allowed but only to promote maintenance of key ACEC characteristics	• Activities allowed but only to promote maintenance of key RNA characteristics	• Use all techniques available for restoration and reforestation	• Activities allowed only to meet LSR objectives	• Use all techniques available for restoration and reforestation
Shrubs/Grass Communities Restoration Activities				
• Limit ground disturbance • Managed grazing and prescribed fire as a management tool permitted	• Limit ground disturbance • Managed grazing and prescribed fire as a management tool permitted	• Prescribed fire permitted • Managed grazing permitted	• Prescribed fire permitted • Limit ground disturbance • Grazing managed not to interfere with attainment of LSR objectives	• Use of prescribed fire, grazing and cultivation to restore grass
Private Lands Acquisition				
• No acquisition	• No acquisition	• No acquisition	• No acquisition	• No acquisition
Special Forest Products				
• Allowed but must not interfere with maintenance of key characteristics	• Allowed but must not interfere with maintenance of key characteristics	• Allowed	• Allowed but must not interfere with attainment of LSR objectives	• Allowed
Horse/ Pack Stock Recreation (same as alt. A)				
• Activities allowed that do not interfere with maintenance of key ACEC characteristics	• Activities allowed that do not interfere with maintenance of key RNA characteristics	• Activities allowed	• Activities allowed	• Activities allowed
Minerals (same as alt. A)				
• Mineral leasing subject to no surface occupancy • Activities allowed but managed to promote maintenance of key ACEC characteristics	• Mineral leasing subject to no surface occupancy • Recommended for withdrawal from locatable mineral entry • Mineral sales are prohibited	• Open for leaseable, locatable and saleable minerals	• Open for leaseable, locatable and saleable minerals	• Open for leaseable, locatable and saleable minerals

Table 3-2. Alternative B

ACEC's	RNA's	Matrix	LSR	Box-O
Facilities/Rights-of-Way				
• Allowed but could not interfere with management of key values	• Allowed but could not interfere with management of key values	• Allowed with no restrictions on Soda Mtn. site	• Allowed but could not interfere with management of LSR objectives	• Allowed

Alternative C

Alternative C places priority on the restoration, maintenance and enhancement of ecological processes. This alternative recognizes the importance of natural disturbance, particularly fire, in the maintenance and restoration of unique plant and animal communities, habitats and biological diversity within the CSEEA. Management activities would be prescribed to maintain or improve the ecological stability of the CSEEA based on knowledge of local ecological relationships and biological processes.

CSEEA Boundary Adjustments

External Boundary

Biological connectivity from the Cascade Siskiyou Ecological Emphasis Area north to the Southern Cascades Ecoregion would be accommodated by the Jenny Creek Late-Successional Reserve (LSR). Under Alternative C, the boundary for the Ecological Emphasis Area east of the Cascade crest would be modified to include all Jenny Creek LSR lands south of Oregon State Highway 66 and west of Jenny Creek. The RMP mapped connectivity corridor would be partially eliminated from the CSEEA. The CSEEA boundary west along the Cascade crest would encompass the upper reaches of Emigrant Creek and scattered BLM parcels in the headwaters of Cottonwood Creek west of Interstate 5 (see map 41).

Internal Boundary

The Pilot Rock ACEC would be expanded to include all lands above 4400' that are contiguous to the rock itself within the CSEEA boundary. The Oregon Jenny Creek ACEC would be expanded to include riparian reserve in Box-O Ranch, and the south section 16,T.40S.,R.4E (if acquired). The known fossil beds would be added to Pilot Rock ACEC (See map 41). Adjust the boundary of the Jenny Creek LSR as recommended in *Jenny Creek Late-Successional Reserve Assessment*. Refer to Appendix Q for LSR boundary adjustments.

Grazing

Livestock grazing management, prescribed fire, tree thinning, and vegetation manipulation would be the primary management tools employed to maintain or improve desirable ecological condition. In order to minimize potentially adverse "ecological shock" from changes in livestock use (Menke report, Appendix N) and socioeconomic impacts, the transition from current grazing leases to more ecologically based grazing plans would be phased in over time as monitoring information becomes available. Grazing management plans would be developed, tested, monitored and adjusted as necessary to move toward desired conditions. If grazing fails to meet ecological goals, livestock use would be adjusted or eliminated. Grazing leases would include terms and conditions necessary to reflect the ecological emphasis of the CSEEA.

Table 3-3. CSEEA Ecological Objectives for Livestock use

Objectives	**Prescribed Livestock use**
Vegetation Management – Weeds	
Reduce weed impact with planned livestock weed reduction program	Reduce localized impact of weeds by adjusting timing, intensity, and herd control.
Reduce influence of livestock as weed seed dispersal vector Improperly managed livestock may be a vector for weed seed dispersal	Limit livestock movement during time of seed dissemination and/or locations of weed infestation
Vegetation Management – Native vegetation	
Vitalize native bunch grass communities using livestock Livestock reduce litter within senescent bunchgrasses and create favorable conditions for native grass seed germination. Current livestock effects are unplanned.	Apply grazing based on observation of senescence and soil surface conditions at specific sites. Length of stay based on impact and utilization.
Reduce impact of livestock on native seed production Seeds are packets of nutrients while also representing future generations of plants. Loss of the native herbaceous component through fire suppression and weed invasion, and the tendency of livestock to graze seed heads may result in a depletion of the native seedbank.	Manipulate timing and intensity of livestock grazing to prevent consumption of native seed and facilitate seed burial. Livestock grazing of seed heads is not a problem when plants are maintained in a state of vigor that allows them to produce an adequate seed crop dependant upon weather conditions. Livestock may improve seed survival by knocking seed heads to the ground and trampling seeds into the soil.
Maintain a competitive balance between the herbaceous and woody components Emphasis on bulk grazers risks making shrubs more competitive than grasses and forbs resulting in more woody species at the cost of herbaceous species, particularly in the absence of fire.	Do not favor the shrub community through overgrazing of the herbaceous component. Monitor closely to prevent shrub dominance.
Maintain, enhance and rejuvenate shrub communities Many shrub communities are senescent in the absence of fire.	Use livestock herding to break up stagnant woody vegetation and scarify seeds with need for physical cracking of seedcoat (wedgeleaf ceanothus and deerbrush). Use livestock grazing and fire as interactive management tools.
Maintain competitive balance between forbs and bunchgrasses Grazing favors plants with growth points (meristems) below or close to the soil surface. Long-term grazing practices may facilitate the loss of native forb species.	Use grazing practices (intensity, timing, etc) and fire interactively to maintain a balance of native forbs and grasses.
Reduce selective grazing or browsing of attractive "Ice Cream" plants Some plant species appear more attractive to livestock resulting in disparate grazing intensity.	Monitor "ice cream" plants and community composition to ensure their maintenance of species richness through rest, rotation, timing and intensity of grazing.

Table 3-3. CSEEA Ecological Objectives for Livestock use	
Objectives	**Prescribed Livestock use**
Maintain a competitive balance between native bunchgrasses and annual grasses Annual grasses out compete native grasses because annuals initiate growth earlier in the season (thereby sequestering nutrients and water) and create unfavorable germination conditions for native grass seeds.	Time intense livestock grazing to reduce annual grass abundance while slower growing native grasses are dormant, or while soil conditions favor young annual grass seedlings being pulled from the ground while grazed.
Restore alien annual grass dominated areas to native grasses. Correct timing of livestock grazing can reduce annual grass seed production. Create more favorable soil surface conditions for the native grass seed germination, and bury native seed through hoof action to improve seed germination and survival.	Reduce annual grasses/reduce annual grass seed production while trampling/burying broadcasted native grass seed by carefully planned localized intense grazing used in conjunction with native grass seed restoration projects.
Enhance soil surface litter decomposition Livestock trampling improves litter soil contact, thereby hastening the decomposition process. More mineral soil surface, a necessity for native grass germination and seedling survival, results.	Use livestock judiciously to favor desired soil surface characteristics in carefully planned and closely monitored projects.
Enhance nutrient cycling Grazing and elimination of livestock wastes increases nutrient cycling between soil and plant. This prevents stagnation, where otherwise labile nutrients are held within slowly decomposing tissues or woody portions of plants, thus becoming unavailable to seedlings and short-lived plants.	Use livestock judiciously to control nutrient stagnation where observation and monitoring indicated that stagnation is a problem.
Reduce impact long-term nutrient export on nutrient poor sites Annual grazing and livestock export represents a loss of nutrients from the system. This is most likely a concern on shallow, nutrient poor soils - in general, nutrient loss through erosion is more likely to be a problem.	Monitor impact of livestock on nutrient poor sites.
Improve soil-seed contact Annual grasses create litter rafts on the soil surface. Since their seeds germinate before native grass seeds, their roots reach the underlying soil before desiccating weather dries the upper part of the soil profile.	Use livestock judiciously to maintain soil surface conditions favorable to native plants where annual plant litter interferes with native plant reproduction.
Reduce long-term carbohydrate depletion Season-long grazing on an annual basis may reduce native grass vigor.	Rest grazed areas at least one year out of three depending on herbaceous community composition (especially weeds).

Table 3-3. CSEEA Ecological Objectives for Livestock use

Objectives	Prescribed Livestock use
Restore and enhance riparian plant communities With a few exceptions cattle have free access to CSEEA water.	Continue to monitor conditions. Develop site specific livestock plans to encourage the growth of streamside herbaceous vegetation to restore natural sediment capture. Allow native riparian trees and shrubs to recover for habitat for native wildlife and plant communities.
Vegetation Management – Fire hazard reduction	
Maintain balance between grazers and browsers Historical abundance of grazers and browsers was likely dependent on the balance of brush and grassland as a result of the fire regime. Current emphasis on bulk grazers in a fire suppressed landscape likely results in an inequitable balance between grazer and browser.	Adjust livestock grazing to suit current condition of the landscape and wildlife component
Obtain and maintain "fire influenced" vegetation patterns using grazing as a substitute for fire in herbaceous components. Grazing might act as a partial substitute for fire the reduction of litter and herbaceous live material. Timing is likely earlier than wildfire (and later than spring prescribed fire).	Use seasonality, timing, and intensity of grazing as a partial substitute fire on native herbaceous communities on portions of the landscape where prescribed fire is not feasible. Be aware of possible detrimental effects of grazing ... see other management objectives.
Fire Hazard Reduction using livestock Livestock are currently not used to specifically reduce fuels and hence fire-hazard	Use livestock to reduce fuels in conjunction with planned prescribed fire or to protect natural and cultural resources as well as private holdings on the landscape.
Grazing Modifications Required to Meet Management Objectives	
Seasonality/timing of Grazing Livestock generally introduced in May or June and removed in October. Dates subject to change depending on annual rain/snowfall patterns. Grazing by native ungulates likely has always followed the same seasonal cycle.	Optimal timing depends on the composition and condition of the herbaceous component, including the presence and abundance of weeds not present historically.
Intensity of Grazing AUMs are adjusted in accordance to rainfall and allotment/pasture level range condition. Historical grazing by native ungulates probably less intense.	Adjust AUMs to suit site specific plant community management objectives ... see other management objectives.
Livestock Dispersal Livestock are currently released on the allotments at locations pre-determined by the range management staff and moved through the allotment on a planned rotation. Native ungulates likely ranged across the landscape, concentrating on recently burned areas. constrained to a smaller portion of the landscape and moved by the action of predators.	Herding must be used enable ultimate control on timing, intensity, and location targeting of livestock impact.

If grazing leases are administratively terminated for ecological reasons or voluntary relinquishment by permittee(s), the BLM would use its general management authority to retire the permit(s) and the forage would be reallocated to wildlife, watershed conservation, riparian, fisheries and/or botanical purposes. Similar processes implemented in Death Valley National Park and Grand Staircase-Escalante National Monument have demonstrated permit retirement as a socially compassionate, policy efficient, politically expedient, and ecologically responsible way to reduce or eliminate grazing on public land.

Livestock grazing within the Research Natural Areas would be utilized only for research purposes and only if the research enhances the resource values. Various experimental management practices would be developed and tested on the Box-O Ranch. Livestock grazing would be carefully managed and all activities would consider the over-riding requirement to maintain or improve the Jenny Creek riparian systems. Based on these studies and existing literature, grazing techniques would be designed to improve ecological conditions, control alien annual grasses, control yellow starthistle, restore desired native bunch grass rangeland, and to investigate the role of grazing in fire hazard reduction.

The Use of Livestock as a Tool to Meet Ecological Objectives

Existing opportunities for landscape level vegetation management are currently restricted by cost constraints and the human presence upon the landscape. Fire suppression policy and the potential risk to private homes and timber holdings may prevent the use of fire as an ecological tool within portions of the CSEEA. Prescribed livestock grazing is seen as one of the viable tools presently available to the land manager which has a relatively low risk of sudden catastrophic plant community change.

Under Alternative C, prescribed livestock management would be used within the CSEEA in a manner that achieves specific biological and ecological objectives. Detailed analysis of vegetation management treatments would be designed to implement changes which would move vegetative communities toward both site specific and landscape level objectives.

Site specific grazing management plans designed to achieve ecological objectives would be developed over three years. A complete transition from commodity based grazing objectives to the use of managed grazing only to achieve ecological objectives (table 3-3) would occur over the subsequent ten years. When grazing leases become available or are up for renewal, they will include terms and conditions necessary to accomplish specific ecological objectives or may be terminated. Grazing lease privileges will not be transferable. Over time a substantial reduction in livestock grazing within the CSEEA will occur under this alternative.

Table 3-3 details the ecological objectives which would be addressed through Alternative C. These objectives, along with the Rangeland Management Standards (Appendix I), would be the guidance for livestock management under Alternative C.

Timber

Matrix forests would be redefined as a district designated Forest Health Reserve (FHR) and managed to restore, maintain and promote diverse and resilient forest ecosystems, and guide the forest toward an appropriate balance of seral stages. No annual harvest (or PSQ) commitment would be associated with the management of this FHR. Harvesting would be implemented in the FHR where needed to enhance structural diversity, improve habitats, reduce stand density, renew tree vigor or diminish the risk of high intensity wildfire.

Transportation

The existing transportation system would be modified to minimize disturbance to wintering black-tailed deer and elk. Where unencumbered by existing rights-of-way and/or road use agreements, most natural surface roads would be eliminated or seasonally closed from October 15 through May 15, except for administrative access. The Skookum Creek road (40-3E-27.2) would serve as the primary access corridor into the CSEEA interior east of the WSA. The Skookum Creek road would be upgraded and maintained through Agate Flat, across the eastern portion of the Schoheim road to the Jenny Creek crossing. In addition, the Skookum Creek road would be strategically gated to prevent unnecessary road surface damage and power line vandalism. Currently the BLM does not have legal access from Copco road to the Jenny Creek crossing (referred to as the Licks in the RMP). In this alternative, the BLM would seek to acquire an easement across private land to access the Jenny Creek crossing, at which time the BLM would improve the stream crossing. The Skookum Creek road from Soda Mountain and the Schoheim road from Jenny Creek, would then serve as the primary administrative access into the eastern portions of the CSEEA. Vehicle access from Copco Road (40S-4E-3.1) across Jenny Creek to Agate Flat would be prohibited except for administrative purposes. The west end of the Schoheim road would be blocked and closed permanently from the road junction near the Pilot Rock parking area east to a location near the west PP&L power line. The existing road grade would be left to be reclaimed by the natural elements or, where practical and consistent with ecological objectives, be decommissioned. Block access to jeep road from Schoheim road in Sec.7,T.41S.,R3E. Existing surfaced roads would be maintained to a level that meet the transportation management objectives (TMOs) for this alternative. Existing natural surface roads would be improved for seasonal use or decommissioned depending on the TMOs. No new roads would be constructed to access FHR lands except for existing reciprocal road right-of-way agreements.

Off-Highway Vehicles

All motorized vehicle traffic, including off-highway vehicles (OHV), would be restricted to surfaced roads. No off-road vehicle use would be permitted within the Box-O Ranch, except for administrative purposes. Seasonal road closures would apply equally to both off-road and passenger vehicles.

Hiking and Non-Motorized Recreation

Non-motorized, non-commercial recreational activities such as hiking, backpacking, mountain biking, picnicking and camping would not be restricted or regulated. Hiking in the RNAs would be confined to existing trails.

Forest Health

All silvicultural tools would be used to promote tree health on the district designated Forest Health Reserve, LSR and Box-O Ranch. Prescribed fire, tree thinning and vegetation manipulation would be the primary management tools and would be employed when necessary to maintain or enhance the condition, structure and species composition of the vegetation. Only activities that promote the maintenance of key resource characteristics may be undertaken in the RNAs and ACECs.

Shrub/Grass Community Health and Restoration

The use of all tools would be available to maintain or enhance the health of the native shrub/grass communities. Activities in the Jenny Creek LSR would not interfere with the attainment of LSR objectives. Activities to maintain or enhance shrub/grass health could occur in the RNAs and ACECs as long as they do not interfere with the maintenance of the key characteristics for which these areas were designated and enhance their ecological and biological values.

Private Land Acquisitions

The BLM would acquire from willing owners, parcels adjacent to the Jenny Creek ACEC, Pilot Rock ACEC and the Oregon Gulch RNA, that would contribute to their ecological objectives and values as they became available.

Special Forest Products

The harvest of special forest products would not be allowed in the ACECs or RNAs but allowed in all other designated land use areas.

Horse/Pack Stock Recreation

The off-road use of pack animals and horses would be allowed, monitored and regulated if warranted, except in the RNAs where Horse/Pack Stock recreation is not encouraged.

Minerals

The CSEEA would be closed to locatable minerals and the area would be recommended for withdrawal mineral entry, mineral leasing would be subject to no surface occupancy and common mineral sales would be prohibited except for administrative purposes.

Facilities/Rights-of Way

Existing authorizations involving the Soda Mountain communication site would be continued although future expansion would be planned and limited to the confines of the immediate existing site. No new recreational facilities would be developed in the CSEEA.

Table 3-4 summaries the activities that may occur under Alternative C.

Table 3-4. Alternative C

ACEC's	RNA's	Matrix	LSR	Box-O
External CSEEA Boundary Adjustments				
•If acquired, expand CSEEA boundary to north to include the south ½ Section 16,T.40S.,R.4E.	•No adjustment	•Eliminate RMP mapped connectivity corridor (map 41)	•Include Jenny Creek LSR lands south of State Hwy. 66	•If acquired, expand CSEEA boundary to north to include the south ½ Section 16,T.40S.,R.4E.
Internal Boundary Adjustments				
•Expand Pilot Rock ACEC to include all lands above 4400' that are contiguous to the rock itself within the CSEEA •Expand Jenny Creek ACEC to include riparian reserve in Box- O Ranch, and the south ½ section 16,T.40S.,R.4E. (if acquired) •Add known fossil beds to Pilot Rock ACEC (map 41)	•No adjustment	•No adjustment	•Adjust boundaries as described in *Jenny Creek LSR Assessment* (see Appendix Q)	•If acquired, expand Box-O boundary to north to include the south ½ Section 16,T.40S.,R.4E.
Grazing				
•Managed grazing to achieve ecological objectives •Will not interfere with key characteristics of ACEC	•Permitted for research purposes that enhance key characteristics of RNA	•Managed grazing only to achieve ecological objectives	•Limited use permitted •Ensure achievement of late-successional objectives and riparian protection	•Use grazing for research purposes that maintains or enhances rangeland while ensuring riparian restoration
Timber/PSQ				
•Manage forest for timber but not to interfere with key characteristics •No PSQ commitment	•Timber harvest for scientific research or demonstration •No PSQ commitment	•Matrix land converted to Forest Health Reserve •No PSQ commitment	•Manage to meet LSR objectives (see LSR plan) •No PSQ commitment	•Forest land converted to Forest Health Reserve •No PSQ commitment

Table 3-4. Alternative C

ACEC's	RNA's	Matrix	LSR	Box-O
Transportation				
•Same as alternative A plus: •Use natural surface roads in Jenny Creek ACEC for administrative purposes only and install crossing over Jenny Creek at (41-2E-10.1) •Maintain roads (40-2E-33) (41-2E-03) to Pilot Rock and parking lot.	•Same as alternative A plus: •Block access to jeep road from Schoheim road in Sec.7,T.41S.,R3E.	•Same as alternative A plus: •No new road construction except for reciprocal agreements •Close Schoheim road: (41-2E-9B) (41-2E-10.0) (41-2E-10.1) from Sec. 12, T.41S.,R3E. near the West PacifiCorp power line to the north end of 41-2E-9B	•Same as alternative A plus: •Maintain Schoheim Road (41-2E-10.1) from Copco Road (40-4E-3.1), including lower crossing on Jenny Creek, west to Skookum Road (40-3E-27.2) •Pursue legal access to Jenny Creek crossing off Copco road	•Same as alternative A plus: •Roads would be surfaced for extended season use •Administrative use only
Off-Highway Vehicle Use				
•Limited to designated roads	•Not permitted in Scotch Creek RNA •Oregon Gulch on designated roads: (40-3E-12.1) (40-3E-19) (40-3E-19.2)	•Limited to designated roads	•Limited to designated roads	•Administrative use only
Hiking/Non-Motorized Recreation				
•Pilot Rock ACEC; Maintain parking and trail •Allowed in other ACECs	•Only on existing trails	•All forms allowed	•All forms allowed	•All forms allowed
Forest Health (Trees)				
•Use silvicultural prescriptions to meet ecological objectives including restoration of riparian areas	•Ecological restoration activities permitted to meet key characteristics objectives for RNA	•Restoration and reforestation of existing plantations permitted •Use silvicultural prescriptions to meet ecological objectives •Limited understory thinning in mature or natural stands	•Restoration and reforestation of existing plantations permitted •Understory thinning in mature or natural stands permitted when necessary to achieve late-successional objectives (Refer to LSR plan executive summary)	•Use silvicultural prescriptions to meet ecological objectives including the restoration of riparian areas

Table 3-4. Alternative C

ACEC's	RNA's	Matrix	LSR	Box-O
Grass /Shrubs/Woodlands Communities Restoration Activities				
•Prescribed fire permitted •Limited ground disturbance •Manage grazing to meet ecological objectives	•Limit ground disturbance •Manage grazing to meet ecological objectives	•Use all techniques available for restoration	•Prescribed fire permitted •Limited ground disturbance •Manage grazing to meet LSR objectives	•Prescribed fire, grazing and cultivation to restore grass
Private Lands Acquisition				
•For Jenny Creek ACEC: Acquire from willing owners as available to expand area of riparian protection and restoration	•For Oregon Gulch RNA: Acquire contiguous adjacent lands from willing owners as available	•No acquisitions	•Acquire lands from willing owners based on criteria in Chapter 4 of Jenny Creek LSR assessment	•Acquire contiguous adjacent lands from willing owners as available, particularly riparian habitat, and south ½ of Section 16,T40S.,R.4E.
Horse/ Pack Stock Recreation				
•Allowed and monitored with options for future restrictions reserved if degradation occurs •Do not promote	•Do not encourage	•Allowed	•Allowed	•Allowed and monitored with options for future restrictions reserved if degradation occurs •Do not promote
Special Forest Products				
•Not allowed	•Not allowed	•Personal use allowed	•Personal use allowed	•Personal use allowed
Minerals				
•No surface occupancy for leasable mineral •Closed to locatable minerals and recommended withdrawn from mineral entry •Common mineral sales would be prohibited except for administrative purposes				

Alternative D

Alternative D emphasizes the maintenance and preservation of the rare and unique ecological processes, conditions, and habitats in the CSEEA with minimum human intervention. Natural processes and events would proceed unhampered with the exception of wildfire or activities required by law, legal restraints, or mandates. Management practices would only be used to prevent the loss of biological and ecological values or for research or scientific purposes that would enhance the objectives of this alternative. Lands that have been previously degraded by commercial timber harvest, livestock impacts, or other human activities would be managed with restoration of natural conditions and processes as the overriding objective. Under this alternative,

Table 3-4. Alternative C

ACEC's	RNA's	Matrix	LSR	Box-O
Facilities/Rights-of-Way				
•Avoid rights-of-way in the following areas: - Areas of Environmental Concerns - Sensitive species habitat •Exclude rights-of-ways in the following areas: - Known special status plant species sites	•Exclude rights-of-ways in the Research Natural Areas	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •Avoid rights-of-ways in the known wetlands	•Avoid rights-of-way in the Late-Successional Reserves	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •Avoid rights-of-ways in the known wetlands

commodity extraction (timber, livestock forage, minerals, water) would only occur under exceptional circumstances where it can be conclusively shown the activity would be clearly beneficial to the biological and ecological values for which the CSEEA was established. This alternative offers maximum protection for big game winter range. The intent of Alternative D is to allow changing CSEEA ecosystems to be driven by natural processes with little or no human interference or management.

CSEEA Boundary Adjustments

External Bondary

Under this alternative the CSEEA would include all federal lands mapped as CSEEA in the 1995 Medford District RMP, the entire Jenny Creek LSR (including proposed boundary adjustments in the *Jenny Creek Late-Successional Reserve Assessment)* and the addition of the Schoolhouse Meadows Spring complex (T.41S.,R4E.,Sec.3,NE1/4), Shoat Springs (T.40S.,R.4E.,Sec.34), and that portion of Jenny Creek just north of the Box-O Ranch (T.41S.,R.4E.,Sec.16,S1/2) as additions to the Jenny Creek ACEC by acquisition from willing owners (see map 42).

Internal Boundary

Alternative D proposes additions to Jenny Creek ACEC, Pilot Rock ACEC, Oregon Gulch RNA, and Scotch Creek RNA (See map 42). Acquisition from willing owners of unimproved private lands within the CSEEA would be pursued to enhance aquatic values.

Jenny Creek ACEC key values would be enhanced by the addition of Fredenburg Springs (T.39S.,R.4E.,Sec.22). The ACEC would be enlarged to include all of Parsnip Lakes and associated wetlands. The addition of Fredenburg Springs and the external additions would offer protection for the springs and associated biota. Jenny Creek ACEC would be expanded to include all riparian reserves on the Box-O Ranch. All streams in the Jenny Creek Watershed with redband trout on BLM land would be added to the ACEC.

The Pilot Rock ACEC boundary would be extended north to the township line between Townships 40 and 41 South between T.40S.,R.02E.,Section 34, 35 and T.41S.,R.02E., Sections 2, 3. The boundary would then extend from the northwest corner of T.41S.,R02E.,Section 3 to include lands in T.41 S.,R02E.,Section 4,SE1/4 to the 4,400' contour, south to the Old Pilot Rock road (41-2E-10.1) to the Hutton/Slide Creek divide, then north to the 4,900' contour under the east face of Pilot Rock to the northeast corner of T41S.,R.02E.,Section 2. This would include the cliffs southeast of Pilot Rock and associated forest wetlands. The two known fossil localities would be included within ACEC boundaries. The Mariposa Unit would be enlarged to include the length of the Oregon/California Trail on BLM lands. (Refer to map 42)

Scotch Creek RNA would be enlarged to include all of the Scotch Creek subwatershed from the Oregon/California border to the contiguous proposed Alternative D Pilot Rock ACEC Unit boundary. This includes both forks of Scotch Creek and Slide Creek.

Oregon Gulch RNA would be enlarged to include the springs and wetland southwest of Randcore Pass and extended east into the Box-O Ranch to include those mixed conifer forests, rare plants and associated plant communities to the boundary of the Jenny Creek Riparian Reserves. Private land in T.40S.,R.4E.,Sec.30,N1/2 and T.40SR.04E., Sec.20,S1/2,SW1/4 would be acquired from willing owners to include the entire watershed in the ACEC.

Grazing

Under this alternative there would be no grazing except under exceptional circumstances where it can be conclusively shown that livestock grazing would be clearly beneficial to the biological and ecological values for which the CSEEA was established.

Timber

Under this alternative there would be no planned timber harvest in the CSEEA except to achieve LSR objectives and all CSEEA lands would be excluded from Medford District timber harvest level determinations (PSQ commitment). Lands designated as "Matrix" under the 1995 Medford District RMP would be removed from that land use allocation and changed to more protective designations such as LSR, ACEC, or RNA.

Transportation

The number of open BLM controlled roads would be substantially reduced as many existing roads would be closed and/or decommissioned. All natural surfaced BLM roads that do not have reciprocal agreements or right-of-way grants would be decommissioned. All natural surfaced BLM roads that have reciprocal agreements or right-of-way grants would have the drainage improved then be closed to unauthorized vehicles. All surfaced BLM roads (with the exception of those listed below) that do not have reciprocal agreements or right-of-way grants would be closed to motorized vehicles. All surfaced BLM roads that have reciprocal agreements or right-of-way grants would have the drainage improved and then be closed to motorized vehicles except for authorized uses. No new roads would be built except as required by reciprocal agreement or law.

Pilot Rock ACEC. Pilot Rock Unit. The Pilot Rock Road (40-2E-33 and -3.0) to the parking lot would remain open; roads south of the parking area (40-2E-3.0, -3.1, -9; 41-2E-9B&C, -10.0, 10.1, .10.2) would be closed. If the permittee relinquishes their rights, the old Pilot Rock Rd. (41-2E-9A) would be decommissioned and blocked at both ends.

Jenny Creek ACEC. Road 39-4E-5 at T.39S.,R.04E.,Sec.15,NE1/4 below Bluejay Spring would remain open. All roads in the Jenny Creek ACEC at the junction of Jenny and Johnson Creek T.39S.,R.04E.,Sec.23 would be closed and decommissioned.

Scotch Creek RNA. In the proposed Alternative D Scotch Creek RNA the following roads would be decommissioned: Schoheim Road (41-2E-10.1) from the western boundary of the Scotch Creek watershed (Hutton/Slide Creek Divide, T41S, R2E, Section 12) to Camp Creek (T41S, R3E, Section 9); Lone Pine Ridge Road from road 40-3E-30 to road 41-2E-10.1; road 40-3E-33. Obliterate the jeep road south of road 40-2E-10.1 on the ridge between the east and west fork of Scotch Creek (T.41S.,R.3E.,Section 7) and keep Scotch Creek Jeep Road closed.

Oregon Gulch RNA. Surfaced road 40-3E-12.1 would be gated at the junction with 40-4E-19.2. The natural surfaced roads 40-3E-19.0 and -19.1 to Rosebud Helipond would be closed to unauthorized vehicles. If the BLM acquires the private land in the SW1/4 Section 20, T.40S., R.4E., the 40-3E-19.0 and -19.1 roads would be closed and decommissioned. Until acquisition, the road would be gated at the junction with 40-3E-12.1.

Soda Mountain Wilderness Study Area. Roads associated with the WSA are discussed under the Jenny Creek Late-Successional Reserve or the Scotch Creek RNA. As a result of reciprocal agreements, except for authorized vehicles, close road 40-3E-30 from Bean Cabin Site on the Pacific Crest National Scenic Trail to the Lone Pine Ridge Road; close road 40-3E-5; and close road 40-3E-34. Decommission roads 40-3E-29 and -29.1. Obliterate the jeep road crossing the WSA in T.41S., R.3E., Sections 1, 2, and 11.

Jenny Creek Late-Successional Reserve. Paved BLM roads and the following BLM rocked roads would remain open: Pilot Rock Road (40-2E-33) to Porcupine Gap; Emigrant Creek Road (39-2E-34); Baldy Creek Road (40-3E-5) to the Saddle; Soda Mountain Road (39-3E-32.3) to the corral in Section 21 SE1/4,T.40S., R.3E.; Lincoln Creek Road (40-3E-12) to Randcore Pass; 40-4E-3 (Fredenburg Road), 39-4E-23.1, 39-4E-9.2, 39-4E-9.0, 39-4E-5.0. The remaining BLM surfaced roads would be closed to unauthorized vehicles. All natural surfaced roads that have reciprocal agreements or right-of-way grants would have drainage improved then be closed to unauthorized vehicles. Other natural surfaced roads would be decommissioned. The Pilot Rock Jeep Road (40-3E-30) would be closed and obliterated from the Soda Mountain Communication Site access road to Baldy Creek Road (40-3E-5). The unnamed jeep road on BLM lands along the south slope of Soda Mountain (T.40S., R.3E., Sections 28 & 29) would be obliterated.

Box-O Ranch. All roads would be decommissioned.

Off-Highway Vehicles

No OHV use in entire CSEEA except for administrative purposes.

Hiking and Non-Motorized Recreation

Non-motorized recreation such as hiking, fishing, hunting, horseback riding, mountain biking, or rock-climbing would occur, but would not be actively promoted. No new recreational facilities or trails would be built, although some existing roads could be converted to trails (Schoheim Rd. Lone Pine Ridge Rd., Old Pilot Rock Rd. Upper Scotch Creek). Bureau guidelines for ACECs and RNAs would be strictly followed (Appendix O).

Forest Health (Trees)

Prescribed fire with limited (manual only) ground disturbance would only be used to avoid the loss of key ecological values or for scientific research in the ACECs and RNAs. Restoration and reforestation of existing plantations on LSR lands would be permitted with limited (manual only) ground disturbance and would include prescribed fire to meet LSR objectives. No other stand enhancement activities would be permitted.

Grass/Shrubs/Woodland Community Health and Restoration

Prescribed fire with limited (manual only) ground disturbance would be used only to avoid the loss of key ecological values or for scientific research in the ACECs, RNAs, and the Box-O Ranch. On LSR lands, restoration and reforestation of existing plantations would be permitted with limited (manual only) ground disturbance and would include prescribed fire to meet LSR objectives. No other stand enhancement activities would be permitted.

Private Land Acquistion

Private lands, as detailed under CSEEA Boundary Adjustments narrative and the Alternative D table, would be acquired from willing owners as lands become available. This would include all private unimproved inholdings and contiguous lands within the CSEEA boundary proposed in Alternative D. Land in T.40S.,R3E.,Sec.10,NW1/4,SW1/4 that include Parsnip Lake and associated wetlands would be acquired from willing owners and added to the Jenny Creek ACEC.

Special Forest Products

Under this alternative, the collection of special forest products would not be allowed.

Horse/Pack Stock Recreation

In the ACECs and LSR, Horse/Pack Stock recreation is allowed on existing roads and the PCNST only, no cross-country travel. Stock-use associated with recreational activities should be prohibited in Natural Areas (USDI 1990a) and, therefore, Horse/Pack Stock recreation is not allowed in the RNAs.

Facilities and Rights-of-Way

Existing uses of all facilities and rights-of-ways would continue under Alternative D. However, there would be no expansion or new facilities built. At the Soda Mountain Communications Site no major expansion would be allowed (no new buildings, towers, or major visible changes or "improvements"). The access road (no BLM number) to the Soda Mountain summit from the Soda Mountain Road (39-3E-32.3) would be repaired so that there is no longer an erosion/sediment source problem. This road would be gated and closed for all but administrative access.

Minerals

The CSEEA would be closed to leasable and locatable mineral, the area would be recommended for withdrawal from locatable mineral entry, and common mineral sales would be prohibited.

Table 3-5. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
External CSEEA Boundary Adjustments				
•Expand Jenny Creek ACEC to include any newly acquired adjacent lands: School-house Meadows Spring complex (T.41S.,R.04E.Sec. 03,NE1/4), Shoat Springs (T.40S.,R.04E.,Sec. 34), and that portion of Jenny Creek just north of the Box-O Ranch (T.41S.,R.04E.,Sec. 16,S1/2)	•No expansion outside of RMP CSEEA boundary except to include newly acquired adjacent lands if any	•Does not apply. No Matrix in this alternative	•Adjust CSEEA boundary to include all LSR lands (see map 42)	•Does not apply. Box-O lands re-allocated under this alternative
Internal CSEEA Boundary Adjustments				
•Expand Jenny Creek ACEC to include Jenny Creek on Box-O Ranch •Expand Pilot Rock ACEC (see text above) •Expand the Pilot Rock Mariposa Unit to include Oregon/California Trail on BLM land •Include Parsnip Lake and wetlands if acquired	•Expand Oregon Gulch RNA to new boundary of Jenny Creek ACEC on Box-O Ranch, to include wetland and adjacent private land. •Expand Scotch Creek RNA to include entire Scotch Creek watershed to the boundary of the enlarged Pilot Rock ACEC unit	•Disperse current matrix allocation lands into other allocations (ACEC, RNA, LSR)	•Adjust boundaries as described in LSR assessment (see Appendix Q). Also add any Matrix acres in the CSEEA (RMP boundary), that are not included in the expanded ACECs and RNAs, to LSR	•Disperse these lands into other allocations (ACEC, RNA, LSR)

Table 3-5. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
Grazing				
•Only under exceptional circumstances	•Only under exceptional circumstances	•Does not apply. No Matrix in this alternative.	•Only under exceptional circumstances	•Does not apply. Box-O lands re-allocated under this alternative.
Timber/PSQ				
•No harvest	•No harvest	•Does not apply. No Matrix in this alternative	•No harvest except to achieve LSR objectives and all CSEEA lands would be excluded from Medford District timber harvest level determinations (No PSQ commitment)	•Does not apply. Box-O lands re-allocated under this alternative
Off-Highway Vehicle Use				
•Prohibited	•Prohibited	•Does not apply. No Matrix in this alternative	•Prohibited	•Does not apply. Box-O lands re-allocated under this alternative

Table 3-5. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
Transportation				
•Same as alternative A plus: •Jenny Creek ACEC: All natural surfaced roads would be closed and decommissioned. •Pilot Rock ACEC Unit: Pilot Rock Road (40-2E-33 and -3.0) to parking area open; roads 40-2E-3.0, -3.1, -9; 41-2E-9, -10.0, -10 .1, -10.2 south of parking area closed. •Old Pilot Rock road (41-2E- 9) would be blocked and decommissioned	•Same as alternative A plus: •Oregon Gulch RNA: Gate 40-3E-12.1 and 40-3E-19.0 at 40-4E-19.2 junction •Scotch Creek RNA: Decommission all natural surfaced roads: Schoheim Road (41-2E-10.1) in expanded RNA; Lone Pine Ridge Road to Schoheim Rd. 41-2E-10.1; obliterate the jeep road on ridge between east and west fork of Scotch Creek	•Does not apply. No Matrix in this alternative	•Same as alternative A plus: •Paved roads remain open •Main arterials open: Pilot Rock Rd. (40-2E-33), Emigrant Cr. Road (39-2E-34); Baldy Cr. Road (40-3E-5), Soda Mtn. Road (39-3E-32.3), Lincoln Cr. Road (40-3E-12), Fredenburg Road (40-4E-3) •Decommission or gate most rocked roads •Close and/or decommission all natural surfaced roads without reciprocal agreements including: portions of 40-3E-34; 40-3E-5 from the 40-3E-30 road intersection to the WSA boundary and roads 40-3E-29 and -29.1. •Obliterate most of the Pilot Rock Jeep Road (40-3E-30), unnamed jeep road on south slope of Soda Mountain, and the Jeep Road crossing the WSA in T.41S.,R.03E., Sections 1,2,11 (Willamette Meridian)	•Box-O lands re-allocated under this alternative to LSR and all roads decommissioned

Table 3-5. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
		Forest Health (Trees)		
•Prescribed fire and manual ground disturbance limited to exceptional circumstances.	•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Does not apply. No Matrix in this alternative	•Restoration and reforestation of existing plantations permitted. •Use of prescribed fire to meet LSR objectives permitted. •Ground disturbance limited.	•Does not apply. Box-O lands re-allocated under this alternative.
		Grass/Shrubs Communities Restoration Activities		
•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Prescribed fire and manual ground disturbance limited to exceptional circumstances	•Does not apply. No Matrix in this alternative	•Restoration and reforestation of existing plantations permitted. •Use of prescribed fire to meet LSR objectives permitted. •Ground disturbance limited.	•Does not apply. Box-O lands re-allocated under this alternative

Table 3-6. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
Private Lands Acquisition				
•Jenny Creek ACEC: Acquire from willing owners as available all private unimproved lands on Jenny Creek to including Fredenburg Springs (39S04E22)and T.41S.,R.04E.,Sec. 16, S1/2, and the Schoolhouse Meadows Spring complex (T.41S.,R.04E.,Sec. 03,NE1/4), Shoat Springs (T.40S.,R.04E., Sec. 34) •Acquire from willing owners as available all private unimproved lands around Parsnip Lake/wetlands	•Oregon Gulch RNA: Acquire from willing owners as available T.40S.,R.04E.,Sec. 30, N1/2 and T.40S.,R.04E.,Sec. 20, S1/2,SW1/4	•Does not apply. No Matrix in this alternative	•Acquire all private unimproved and contiguous lands from willing owners within the Alternative D CSEEA boundary	•Does not apply. Box-O lands re-allocated under this alternative
Hiking/ Non-Motorized Recreation				
•Pilot Rock ACEC; Maintain parking and trail •Allowed in other ACECs.	•Only on existing trails	•Does not apply. No Matrix in this alternative	•All forms allowed	•Does not apply. Box-O lands re-allocated under this alternative.
Horse/ Pack Stock Recreation				
•Allowed on existing roads and the PCNST only; no cross-country travel	•Not permitted	•Does not apply. No Matrix in this alternative	•Allowed on existing roads and the PCNST only; no cross-country travel	•Does not apply. Box-O lands re-allocated under this alternative.

Table 3-5. Alternative D

ACECs	RNAs	Matrix	LSR	Box-O
Special Forest Products				
•Not allowed	•Not allowed	•Does not apply. No Matrix in this alternative	•Not allowed	•Does not apply. Box-O lands re-allocated under this alternative
Minerals				
•Closed to leasable mineral •Closed to locatable minerals and recommended to withdraw from mineral entry •Common mineral sales would be prohibited	•Closed to leasable mineral •Closed to locatable minerals and recommended to withdraw from mineral entry •Common mineral sales would be prohibited	•Does not apply. No Matrix in this alternative	•Closed to leasable mineral •Closed to locatable minerals and recommended to withdraw from mineral entry •Common mineral sales would be prohibited	•Does not apply. Box-O lands re-allocated under this alternative
Facilities /Rights-of-ways				
•Avoid rights-of-way in the following areas: - Areas of Environmental Concerns - Sensitive species habitat •Exclude rights-of-ways in the following areas: - Known special status plant species sites	•Exclude rights-of-ways in the Research Natural Areas	•Does not apply. No Matrix in this alternative	•Avoid rights-of-way in the Late-Successional Reserves	•Does not apply. Box-O lands re-allocated under this alternative

Alternative E

This alternative emphasizes environmentally responsible recreation throughout the planning area. Most BLM administered land in the planning area would be managed for a variety of recreation opportunities consistent with other resource management objectives.

Boundary Adjustments (same as alt. A)

No external or internal adjustments to the boundary described in Medford District RMP are proposed in this alternative. (See map 43)

Grazing (same as alt. A)

Livestock grazing is allowed across all of the CSEEA. RMP provides for livestock grazing in an environmentally sensitive manner, consistent with management objectives (i.e. Aquatic Conservation Strategy) and land use allocations (i.e. LSR). The RMP also provides for rangeland improvement projects and management practices, consistent with management objectives and land use allocations. RMP management direction is given to adjust grazing practices that prevent attainment of the Aquatic Conservation Strategy (ACS) and riparian reserve objectives in riparian areas and LSRs. The Box-O Ranch was acquired near the completion of the RMP and is not specifically addressed in the document. The land use allocation for the Box-O Ranch is Matrix.

Timber (same as alt. A)

Matrix land is primarily managed to produce forest products and contribute toward the Medford District's probable sale quantity (PSQ). Prescribed fire, timber harvest, grazing and vegetation manipulation are available as management tools and applied as necessary to enhance or maintain desirable habitat conditions, vegetation species composition and structure of forest land in the matrix and LSR. The Jenny Creek LSR is managed for the protection, maintenance and enhancement of late-successional habitat. The RMP directs the preparation of a management assessment for the LSR which was prepared in 1999. Timber harvest in the LSR would not contribute toward the PSQ. The Box-O Ranch is currently in the Matrix land use allocation. The Oregon Gulch RNA, Jenny Creek ACEC and the Pilot Rock ACEC are not available for timber harvest under the RMP. Timber harvest could occur in the Scotch Creek RNA.

Transportation

The transportation system in the ACECs, Matrix, and LSR would be managed the same as in Alternative A except natural surface roads would have the drainage improved, maintained and remain open all year round. In the RNAs there would be no cross-country travel, surfaced roads would be open all year and natural surface roads closed during wet season. Roads at the Box-O Ranch would be rocked, maintained and remain open all year round.

Off-Highway Vehicle

In ACECs , Off-Highway Vehicle use would be restricted to existing roads. In RNAs, cross country travel would not be allowed but surfaced roads would be open to travel year round. The use of natural surfaced roads would be restricted during the wet season. There are no roads within the WSA. A 'way' exists within the WSA and it is currently open. All cross country travel by motorized and mechanized vehicles is prohibited within the WSA by the IMP. Matrix and LSR lands would be open to cross country OHV use except where key resource damage occurs. Surfaced roads within the Matrix and LSR lands would remain open year round and natural surface roads would be improved and maintained and remain open. OHV travel on the Box-O Ranch would be restricted to existing roads and they would be rocked, maintained and remain open for administrative use only. Designation of existing roads within the Agate Flat, Skookum Creek and Soda Mountain areas as part of the Oregon Back Country Discovery Route would occur and the Schoheim road would be improved, maintained, and designated as a Back Country Byway.

Hiking and Non-Motorized Recreation

Hiking and non-motorized recreation including horse and pack-stock use would be allowed in ACECs and RNAs but managed to promote the maintenance of the key characteristics for which they were designated. These activities would be allowed in the remainder of the planning area (Box-O Ranch, Matrix and LSR).

Under alternative E numerous recreational facilities would be constructed or upgraded to facilitate hiking and non-motorized recreation. A hiking trail would be constructed down Lone Pine ridge to Cathedral Hills overlook and interpretive signs installed. Another hiking trail down Porcupine gap to Scotch Creek falls would be constructed. Improvements to the Oregon/California trail would be made to facilitate hiking and interpretive signs would be installed along the trail. The Pilot Rock trail would be improved and signed. A shelter and picnic area would be developed near the headquarters of the Box-O Ranch and a kiosk installed to disseminate current and historical information about the ranch. Picnic areas would also be developed at Pilot Rock (near the parking area), Boccard Point, and Soda Mountain. Interpretive signs or kiosks would be installed near the picnic tables.

Campgrounds would be developed under alternative E. Sites for future campgrounds would be near the lower crossing of Jenny Creek (also called "the Licks") and the near the Soda Mountain corrals. The corrals at Soda Mountain would be improved and maintained. An improved stream crossing would be developed along with the campground development at the Licks if access is obtained. The historic Bean Cabin would be rebuilt on-site and primitive horse corrals with a capacity of up to 8 horses would be built nearby. An interpretive display would be designed and built near Pilot Rock to explain the trail environment and associated resource values.

Forest Health (trees) (same as alt. A)

The use of all silvicultural tools available to promote tree health and reduce risk of damaging events may be used on Matrix land and the Box-O Ranch. Only activities that promote the maintenance of key resource characteristics may be undertaken in the RNAs, and ACECs. Silvicultural tools to promote health in the LSR would be consistent with enhancing old-growth habitat while meeting LSR objectives.

Grass /Shrub/Woodland Community Health and Restoration (same as alt. A)

The use of all tools would be available to maintain or enhance the health of the native shrub/grass communities is allowed in the matrix land and Box-O Ranch. Activities in the Jenny Creek LSR must not interfere with the attainment of LSR objectives. Activities to maintain or enhance shrub/grass health could occur in the RNAs or ACEC as long as they do not interfere with the maintenance of the key characteristics in those areas.

Private Land Acquisitions (same as alt. A)

Land acquisitions for RNAs, ACECs or LSR would occur when opportunities to conserve biological diversity exist. BLM ownership in the Jenny Creek watershed would be consolidated, where possible, to improve watershed management. Land acquisitions for matrix land and Box-O Ranch would occur when opportunities to conserve biological diversity exist or to enhance management opportunities. All land acquisition would be obtained from willing owners.

Special Forest Products (same as alt. A)

Special forest products are to be managed for the production and sale when demand is present and where actions taken are consistent with primary objectives for the land use allocation. Principles of ecosystem management are to be used to guide the management and harvest of special forest products. There would be no harvesting of special forest products in ACECs, RNAs, designated wetlands, special status flora or fauna sites. Only limited harvesting would occur in special habitat sites, White oak woodlands sites, known cultural sites, fragile soils sites, LSRs, riparian reserves, or key watersheds.

Horse/ Pack Stock Recreation

This form of recreation would be allowed in ACECs and RNAs but managed to promote the maintenance of the key characteristics for which they were designated. These activities would be allowed in the remainder of the planning area (Box-O Ranch, Matrix and LSR). The corrals at Soda Mountain would be improved and maintained.

Minerals (same as alt. A)

The CSEEA would be open for leaseable, locatable and saleable minerals for all designated land use areas except the ACECs and RNAs. Mineral leasing in the ACECs are subject to no surface occupancy. The RNAs would be closed to leasable mineral, the area would be recommended for withdrawal from locatable mineral entry, and common mineral sales would be prohibited.

Facilities/Rights-of-Way (same as alt. A)

One objective in the RMP is to continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in the RMP. Another RMP objective is to ensure all rights-of-way for hydroelectric developments are consistent with the northwest Power planning council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values. Land use allocation direction pertaining to the CSEEA are:

- Allocation of lands to existing rights-of-way corridors and communication sites would continue.
- Subject to valid existing rights and with the exception of buried lines in rights-of-way of existing roads, exclude rights-of-ways in the following areas:
  - Research natural areas
  - Wilderness study areas
  - Known special status plant species sites
- With the exception of buried lines in rights-of-way of existing roads, avoid rights-of-ways in the following areas:
  - Areas of environmental concerns
  - Sensitive species habitat
  - Known wetlands
  - Late-successional reserves

Rights-of-way may be granted in avoidance areas when no feasible alternate route or designated rights-of-way corridor is available.

Table 3-6 summarizes activities that could occur in the CSEEA under Alternative E.

Table 3-6. Alternative E

ACEC's	RNA's	Matrix	LSR	Box-O
External CSEEA Boundary Adjustments (same as Alt. A)				
•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP
Internal Boundary Adjustments (same as Alt. A)				
•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP	•No Adjustments to boundary described in Medford District RMP
Grazing (same as Alt. A)				
•Allowed •Adjust grazing to meet ACS/riparian reserve objectives	•Allowed •Adjust grazing to meet ACS/riparian reserve objectives	•Allowed •Adjust grazing to meet ACS/riparian reserve objectives	•Allowed •Adjust grazing to meet ACS/riparian reserve objectives	•Allowed •Adjust grazing to meet ACS/riparian reserve objectives
Timber/PSQ (same as Alt. A)				
•No timber harvest	•No timber harvest in Oregon Gulch RNA •Allowed in Scotch Creek RNA & contributes to PSQ	•Timber harvest on sustainable basis. •Contributes to PSQ	•Allowed only to meet LSR objectives •Does not contribute to PSQ	•Timber harvest on sustainable basis. •Contributes to PSQ
Transportation				
Same as alternative A plus: •Natural surface roads - improved, maintained, and remain open	Same as alternative A plus: •No cross-country travel •Surfaced roads open all year. •Natural surface roads closed during wet season	Same as alternative A except: •Natural surface roads-maintained and remain open	Same as alternative A except: •Natural surface roads - maintained and remain open	Same as alternative A plus: •Restricted to existing roads which would be rocked, maintained and remain open for administrative use only

Table 3-6. Alternative E

ACEC's	RNA's	Matrix	LSR	Box-O
Off-Highway Vehicle Use				
•Pilot Rock ACEC restricted to existing roads •Jenny Creek ACEC restricted to existing roads •The Schoheim road would be improved, maintained, and designated as a Back Country Byway	•Closed to OHV use	•Open to OHV use •The Schoheim road would be improved, maintained, and designated as a Back Country Byway	•Open to OHV use •Designate existing roads within the Agate Flat, Skookum Creek and Soda Mountain areas as part of the Oregon Back Country Discovery Route •The Schoheim road would be improved, maintained, and designated as a Back Country Byway	•Restricted to administrative use only
Hiking/ Non-Motorized Recreation				
•Activities allowed but managed to promote maintenance of key ACEC characteristics •Develop campground at "the Licks" and improve stream crossing •Improve trail to Pilot Rock and place picnic tables near parking area	•Activities allowed but managed to promote maintenance of key RNA characteristics	•Activities allowed •Improve OR/CA trail for hiking •Develop picnic area near Boccard Point and Soda Mtn. •Build trails to Cathedral Cliffs and Scotch Creek Falls •Rebuild the historic Bean Cabin •Build primitive corrals for equestrian users of the PCNST near the Bean Cabin	•Activities allowed	•Activities allowed •Develop picnic area and shelter •Install kiosk
Forest Health (Trees) (same as Alt. A)				
•Activities allowed but only to promote maintenance of key ACEC characteristics	•Activities allowed but only to promote maintenance of key RNA characteristics	•Use all techniques available for restoration and reforestation	•Activities allowed only to meet LSR objectives	•Use all techniques available for restoration and reforestation

Table 3-6. Alternative E.

ACEC's	RNA's	Matrix	LSR	Box-O
Grass/Shrubs/Woodland Communities Restoration Activities (same as Alt. A)				
•Activities allowed but only to promote maintenance of key ACEC characteristics	•Activities allowed but only to promote maintenance of key RNA characteristics	•Use all techniques available for restoration	•Activities allowed only to meet LSR objectives	•Use all techniques available for restoration
Private Lands Acquisition				
•Make land tenure adjustments emphasizing opportunities that conserve biological diversity •Acquire land along Jenny Creek where possible	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities	•Make land tenure adjustments emphasizing opportunities that conserve biological diversity or enhance management opportunities
Special Forest Products (same as Alt. A)				
•Not Allowed	•Not Allowed	•Allowed	•Limited activities that must not interfere with attainment of LSR objectives.	•Limited activities for personal use only allowed
Horse/ Pack Stock Recreation				
•Activities allowed but managed to promote maintenance of key ACEC characteristics	•Activities allowed but managed to promote maintenance of key RNA characteristics	•Activities allowed •Improve corrals at Soda Mtn.	•Activities allowed	•Activities allowed
Minerals (same as Alt. A)				
•Mineral leasing subject to no surface occupancy •Activities allowed but managed to promote maintenance of key ACEC characteristics	•Mineral leasing subject to no surface occupancy •Recommended for withdrawal from locatable mineral entry •Mineral sales are prohibited	•Opened for leasable, locatable and saleable minerals	•Opened for leasable, locatable and saleable minerals	•Opened for leasable, locatable and saleable minerals

Table 3-6. Alternative E

ACEC's	RNA's	Matrix	LSR	Box-O
Facilities/Rights-of-Way (same as Alt. A)				
•Avoid rights-of-ways in the following areas: - Areas of Environmental Concerns - Sensitive species habitat •exclude rights-of-ways in the following areas: - Known special status plant species sites	•Exclude rights-of-ways in the Research Natural Areas	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •avoid rights-of-ways in the known wetlands	•Avoid rights-of-ways in the Late-Successional Reserves	•Make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans •avoid rights-of-ways in the known wetlands

California BLM Land Within the CSEEA Boundary of Consideration

As previously stated, this plan only addresses boundary issues associated with BLM administered land in California within the CSEEA analysis area (map 2). This land exist within or adjacent to the Klamath-Iron Gate, Cottonwood Creek and the Jenny Creek watersheds. Specifically, the land that make up or are associated with the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA. Management activities specific to these lands will be addressed by the BLM Redding Field Office in a forthcoming resource management plan amendment.

After scoping, the planning team developed four alternatives that address the possible external boundary adjustments of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA. These alternatives address the inclusion of these special land use designated areas into the CSEEA.

Alternative A (No Action)

This alternative would reflect the current management direction pertaining to the boundaries of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA in the *Redding Resource Management Plan* (RRMP). The RRMP specifically states that BLM will "Acquire available, unimproved privately owned land between Interstate 5 and the existing public lands. Acquire the eastern one-half of Section 20, T.48 N., R.5 W" (Mt. Diablo Meridian) and add to the Horseshoe Ranch Wildlife Area. The *Redding Resource Management Plan* would "Acquire available, unimproved privately owned land within the canyon of Jenny Creek"for addition to the ACEC/RNA. Under Alternative A, management direction associated with the boundaries of these designated areas would not change. Under this alternative the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA would be excluded from the CSEEA. (See Alternative A map 39)

Alternative B

This alternative was developed to provide the highest sustainable commodity outputs, primarily beef production and forest products, while adequately accommodating deer winter range protection. Under this alternative, the Horseshoe Ranch Wildlife Area boundary would be smaller than described in the *Redding Resource Management Plan*. BLM land in Sections 21, 22 and 34, T.48N., R.6W. and 28, T.48N., R.5W. (Mt. Diablo Meridian) would be excluded from the Horseshoe Ranch Wildlife Area along with State owned land in Section 15, T.48N., R.6W. There would be no private land acquisitions to increase the size of the Horseshoe Ranch Wildlife Area or the Jenny Creek ACEC/RNA. Under this alternative the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA would be excluded from the CSEEA. (See Alternative B map 40)

Alternative C

Alternative C emphasizes deer winter range protection and maintaining ecological values while accommodating sustainable commodity outputs. Under this alternative, the Horseshoe Ranch boundary would be the same as Alternative A. Proposed acquisitions from willing owners on the west side of the Horseshoe Ranch Wildlife Area include unimproved privately owned land in the eastern one-half of Section 16, T.48N., R.6W. and all of Section 27, T.48N., R.6W.(Mt. Diablo Meridian). These acquisitions would be added to the Horseshoe Ranch Wildlife Area. Proposed acquisitions for the Horseshoe Ranch Wildlife Area on the east side include the eastern one-half of Section 20, T.48N., R.5W. The Jenny Creek ACEC/RNA boundary would remain as listed in the *Redding Resource Management Plan* with the direction to acquire available, unimproved privately owned land from willing owners within the canyon of Jenny Creek from Iron Gate Reservoir to the Oregon border. Under Alternative C, the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA would become part of the CSEEA. (See Alternative C map 41)

Alternative D

Alternative D promotes the enhancement of deer winter range and ecological values above other resource interests. This alternative would maximize the size of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA without significantly impacting grazing and timber activities. Under this alternative, the Horseshoe Ranch Wildlife Area would be the same size as in Alternative C but the potential acquisition of private land from willing owners would be greater. In addition to the proposed acquisitions in Alternative C, unimproved privately owned land in Sections 13, 14, 15, 16, 20, 21, 22, 23, 26, 27, 28 and 32, T.48N., R.5W. (Mt. Diablo Meridian) would be acquired from willing owners and added to the Horseshoe Ranch Wildlife Area. Unimproved privately owned land in Sections 33 and 34 north of Iron Gate Reservoir would also be acquired. These acquisitions would put most of the Slide Creek, Scotch Creek, Camp Creek, Jenny Creek, and Rocky Gulch sub-watersheds in California under the coordinated management of the BLM and State of California. On the west side of Horseshoe Ranch Wildlife Area, unimproved privately owned land between Interstate 5 and the existing public lands in Township 48 North would be acquired from willing owners and added to Horseshoe Ranch Wildlife Area.

Acquisitions for the Jenny Creek ACEC/RNA include unimproved privately owned land in Sections 13, 25 (up to the ridge line) and 26, T.48N., R.5W. (Mt. Diablo Meridian) from willing owners. This acquisition would ensure the protection and promote enhancement by supplying a buffer area to the Jenny Creek canyon. Both the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA would become part of the CSEEA and a collaborative effort among the State and Federal agencies in Oregon and California would evolve to manage the Area toward its highest potential. (See Alternative D map 42)

Table 3-7 summarizes the Boundary Alternatives for the California land in the CSEEA.

Table 3-7. Boundary Alternatives for the California land in the CSEEA

Alternative A	Alternative B	Alternative C	Alternative D
•Reflect the current management direction pertaining to the boundaries of the Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA in the *Redding Resource Management Plan* •Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA excluded from CSEEA	•BLM land in Sections 22 and 34, T.48N., R.6W. and 28, T.48N., R.5W. and State owned land in Section 15 T.48N., R.6W. (Mt. Diablo Meridian) would be excluded from the Horseshoe Ranch Wildlife Area •No private land acquisitions •Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA excluded from CSEEA	•The Horseshoe Ranch boundary would be the same as Alternative A •Proposed acquisitions from willing owners on the west side of the Horseshoe Ranch Wildlife Area include unimproved privately owned land in the eastern one-half of Section 16, T.48N., R.6W. and all of Section 27, T.48N., R.6W.(Mt. Diablo Meridian) •Proposed acquisitions for the Horseshoe Ranch Wildlife Area on the east side include the eastern one-half of Section 20, T.48N., R.5W. (Mt. Diablo Meridian) •Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA included into CSEEA	•Same as Alt. C **plus** acquire from willing owners unimproved privately owned land in Sections 13, 14, 15, 16, 20, 21, 22, 23, 26, 27, 28 and 32, T.48N., R.5W. (Mt. Diablo Meridian) would be acquired from willing owners and added to the Horseshoe Ranch Wildlife Area. Unimproved privately owned land in Sections 33 and 34 north of Iron Gate Reservoir would also be acquired •On the west side of Horseshoe Ranch Wildlife Area, unimproved privately owned land between Interstate 5 and the existing public lands in Township 48 North would be acquired from willing owners and added to Horseshoe Ranch Wildlife Area •Acquisitions for the Jenny Creek ACEC/RNA include unimproved privately owned land in Sections 13, 25 (up to the ridge line) and 26, T.48N., R.5W. (Mt. Diablo Meridian) from willing owners •Horseshoe Ranch Wildlife Area and the Jenny Creek ACEC/RNA included into CSEEA

Management Common To All Alternatives

Special National Designation

The CSEEA is currently being evaluated for potential national designation as a National Conservation Area or a National Monument. All Alternatives and their plans would be subject to any future Special Designation. Subsequent legislation or a proclamation could included all or portions of the CSEEA analysis area in a Special National Program. Management plans developed in this document may be adopted or modified to comply with the required criteria associated with a subsequent special designation.

Management of Soda Mountain WSA

In1991, the Secretary of the Interior recommended to the President of the United States who subsequently recommended to Congress that certain areas currently designated as WSAs be officially designated as wilderness and that certain other areas designated as WSAs be deleted from wilderness consideration. The recommendation for the Soda Mountain WSA was for 5,867 acres suitable for wilderness designation and 28 acres not recommended for wilderness designation. Until Congress acts on the President's recommendation for the Soda Mountain Wilderness Study Area, it is to be managed under BLM's *Interim Management Policy For Lands Under Wilderness Review*, H-8550-1. This manual describes the policies under which the Bureau of Land Management will manage lands under wilderness review until Congress either designates these lands as wilderness or releases them for other purposes. This policy is referred to as the interim management policy (IMP) because it applies to specific areas of the public lands for a limited amount of time, depending upon various stages and schedules of the review process.

The IMP applies only during the time a WSA is under wilderness review and until Congress acts on it, or where applicable, by a final decision by the BLM. After Congress acts on the President's recommendations for each WSA, a different policy will apply, depending on whether or not Congress designates the area as wilderness. Areas designated as wilderness will be managed under BLM manual 8560-Management of Designated Wilderness Areas and under the regulations at 43 CFR 8560. Areas released from wilderness study will no longer be subject to the IMP, and will be managed under general BLM management policies and applicable land-use plans. If Congress addresses wilderness issues and they choose not to designate the Soda Mountain WSA as wilderness, the lands would be managed under one of the proposed alternatives listed in Table 3-8

Planning Area Ownership

All EIS analysis and planning only applies to federally owned and managed land. This planning process does not involve private land. Although some alternatives have identified privately owned parcels for possible acquisition, all purchases or trade would be conducted or pursued with cooperating owners as identified parcels become available.

Noxious Weed Control and Management

The control and management of noxious weeds for all alternatives will be directed by and conform to the Medford District's Integrated Weed Management Plan and

Table 3-8. Management of Soda Mountain Wilderness Study Area If Not Designated Wilderness

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
•Manage the west half as part of the LSR and manage the east half as part of the CSEEA	•Revert to and managed as Matrix land	•Area converted to a district designated Forest Health Reserve (FHR).	•Change land use designations to LSR	•Manage west half as FHR and the east half as matrix.

Environmental Assessment (EA) #OR-110-98-14 (Appendix P), tiered to the Northwest Area Noxious Weed Control Program Environmental Impact Statement prepared 12-85 and amended 3-87.

Management of Fire Suppression Activities

The option to allow natural ignition fires to burn by not immediately suppressing them in order to achieve ecological objectives is not available for any alternative. Due to ownership patterns and political constraints, the use of wildfire to meet resource objectives is not possible. The BLM contracts with the Oregon Department of Forestry (ODF) for fire suppression on public land in western Oregon. Immediate action would occur to control and suppress all fires to minimize total acres burned while providing for fire fighter safety. Although suppression tactics and practices may vary among alternatives, initial response and escape fire policy will be governed by the Bureau of Land Management, Master Cooperative Fire Protection Agreement #HA-A98-2A00, 10-14-98 with ODF. Areas within the CSEEA which requires special suppression methods designed to minimize damage to unique habitat and resources have been designated. These areas of special concern which require specific fire suppression tactics or limit tactics within the CSEEA are listed in Appendix F.

Prescribed Fire Management

Prescribed fire would be used to meet resource management objectives which would include but not limited to wildfire hazard reduction, restoration of desired vegetation conditions, habitat management and silvicultural treatments. Prescribed fire plans in Areas of Critical Environmental Concern (ACEC) and Research Natural Areas (RNA) would be based on the fire history of the area and past vegetative patterns known for the area. The application of prescribed fire would approximate the natural intensity and frequency as closely as possible. For the use of prescribed fire in the LSR refer to the guidelines in chapter 4 of the *Jenny Creek Late-Successional Reserve Assessment*. The Fire Management Plan for the Soda Mountain Wilderness Study Area (Appendix G) identifies prescribed fire management guidelines.

Air Quality Management

The management of Air Quality as a result of BLM resource management activities such as smoke from prescribed burning, application of herbicides used to control unwanted vegetation, and dust from use of roads is covered by the Medford District RMP (USDI 1995a)to which this DEIS is tiered.

Archaeological Site Protection

A number of federal laws, including the National Environmental Policy Act and Federal Land Policy and Management Act, direct federal agencies to preserve important cultural and historical sites. In addition, the National Historic Preservation Act (NHPA) requires agencies to consider the effects of their actions on significant historic sites. Section 106 of the NHPA provides a process for identifying, evaluating, and assessing effects of federal actions on cultural resources. The Programmatic Agreement between the BLM, the Advisory Council on Historic Preservation, and National Conference of State Historic Preservation Officers, and a Protocol for Managing Cultural Resources established by the Oregon State Historic Preservation Office and the BLM Oregon/Washington State Office implements this act. The requirements of federal law pertaining to cultural resources are common to all alternatives.

Special Use Activities

General Recreation Permit Policy

Objectives of the BLM recreation permitting system are to satisfy recreational demand within allowable use levels in an equitable, safe, and enjoyable manner while minimizing adverse resource impacts and user conflicts. In issuing permits to recreational users of public lands, the BLM authorizes permittees use of the lands and/or related waters for the intended purposes. This represents a privilege to use public lands and/or related waters which is subject to the terms and conditions of the permits.

Recreation permits are managed in a manner which is consistent with the management objectives determined in resource management plans, recreation area management plans, or in their absence, through recreation management objectives resulting from analysis of resources and visitor use for each area.

Recreation permits are issued for specific recreational uses of the public lands and related waters. They are issued as a means to manage visitor use, protect natural and cultural resources, and provide a mechanism to accommodate commercial recreational uses. Authorized by the Land and Water Conservation Fund Act (LWCFA), there are four types of uses for which these permits are required: commercial, competitive, organized groups/events, and individual or group use in special areas.

Commercial use is defined as recreational use of the public lands and related waters for business or financial gain. Examples of commercial activities include outfitters and guides, jeep tours, horse trail and wagon train rides, cattle drives, and photography associated with a recreational activity.

Competitive use means any organized, sanctioned, or structured use, event, or activity on public land in which two or more contestants compete and either of the following elements apply: (1) Participants register, enter, or complete an application for the event; or (2) A predetermined course or area is designated. It also means one or more individuals contesting an established record such as speed or endurance. Examples of competitive events include OHV races, horse endurance rides, mountain bike races, and rodeos.

Special Area use permits may be required for individual (private, noncommercial) recreation use in Special Areas. Special Areas are areas officially designated by statute or Secretarial order including: components of the National Trails System, the National Wild and Scenic Rivers System; National Conservation Areas, Monuments and Recreation areas; the National Wilderness System; an area covered by joint agreement between the BLM and a State government as provided for in Title II of the Sikes Act; or any area where the authorized officer determines that the resources require special management and control measures for their protection and a permit system for individual use would achieve management objectives. Examples of individual permits for Special Areas include camping in Long Term Visitor Areas, floating many BLM-managed rivers, hiking in the Wilderness Areas, and recreational mining in designated areas.

Organized Group Activity and Event Use permits are for noncommercial and noncompetitive group activities and recreation events. The authorized officer determines when a permit is required based on resource concerns, user conflicts and/or the need for monitoring. In some instances, the decision to require organized group/event permits may be through planning. Examples of group or events that may require a permit include a large scout camp out, a fraternity activity, a large Native American gathering, a large family reunion, or a dual sport event.

Issuing a Special Recreation Permit (SRP) is a discretionary action. Applications for uses requiring an SRP may be denied based upon factors such as a moratorium issued as part of planning decisions; the results of an environmental analysis; other resource values; an allocation system; public health and safety; the applicant's past performance; or the inability of the managing office to issue, manage, and monitor the proposed use. Before issuing a Special Recreation Permit for an activity or group event, a determination is made that the requested use is primarily recreational. If not, it may be more appropriate to authorize as a land use permit under FLPMA (see **General Land Use Authorization Policy** section).

General Land Use Authorization Policy

BLM'S authority for issuing land use authorizations on the Public Lands was established by Congressional action in 1976. That was the year Congress passed Public Law 94-579, known as *Federal Land Policy and Management Act* (FLPMA). With the passage of FLPMA, the BLM was given broad directives to manage the public lands for multiple uses utilizing a variety of "tools" to achieve this end. Under Title III, Section 302 (b) of FLPMA it states:

- "In managing the public lands, the Secretary shall, subject to this Act and other applicable law and under such terms and conditions as are consistent with such law, regulate, through easements, permits, leases, licenses, published rules, or other instruments as the Secretary deems appropriate, the use, occupancy, and development of the public lands..."

In addition to the above, Title V of FLPMA, Section 501 (a) states:

- "The Secretary, with respect to the public lands....is authorized to grant, issue, or renew rights-of-way over, upon, under, or through such lands...."

FLPMA then goes on to list in detail the various types of uses for which rights-of-way may be used. The list includes roads, railroads, trails, canals, ditches, pipelines, waterlines, utility lines, communication sites, etc.

While FLPMA provides us the legal framework for authorizing any of the above actions, each application received by BLM is reviewed, processed, and decided based on it's own merits. Applications are reviewed by an interdisciplinary team in order to determine if the application is consistent with existing policy and the objectives of various land use plans under which the Medford District operates.

The majority of the land use authorizations issued by the Ashland Resource Area (RA) of the Medford District, would fall into two categories of rights-of-way, i.e. roads and utilities. Many of these actions are small scale in nature, being a half-acre or less in size. Others are quite large and extend for many feet or miles across public lands. The last major linear right-of-way issued by the Ashland RA was for the Pacific Gas Transmission (PGT) underground natural gas pipeline between Klamath Falls and Medford.

Permits issued under FLPMA are those not considered recreational in nature. Recreational permits fall under a different authority (see **General Recreation Permit Policy** section). The Ashland Resource Area of the BLM Medford District has issued FLPMA permits for religious gatherings, military training exercises, and commercial filming activity.

In most cases, issuing a right-of-way grant under FLPMA is a discretionary action. However, in those instances where private land is surrounded by public land, we are required to provide reasonable access.

Aquatic Conservation Strategy

Under any alternative selected, management activities and practices within the CSEEA will be consistent with the Aquatic Conservation Strategy (ACS) described in the *Final Supplemental Environmental Impact Statement on the Management of Habitant for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl* (USDA/USDI,1994), and the U.S. Department of Interior Bureau of Land Management Medford District's *Record of Decision and Resource Management Plan* (USDI,1995).

Best Management Practices

Under any alternative selected, management activities and practices within the CSEEA will be consistent with the Best Management Practices described in Appendix D of the U.S. Department of Interior Bureau of Land Management Medford District's *Record of Decision and Resource Management Plan* (USDI,1995).

Management of Fish and Wildlife by the State of Oregon

The BLM manages wildlife habitat on BLM lands. The Oregon Department of Fish and Wildlife and the U.S. Fish and Wildlife Service have responsibility for management of wildlife populations (setting target population levels, protecting special species, hunting laws, etc) throughout their jurisdictions. The BLM works cooperatively with state and other federal agencies to ensure that federal habitat management is consistent with population management goals. Therefore, the management of fish and wildlife (including hunting, trapping and fishing) by the State of Oregon will not be addressed in this document.

Pacific Crest National Scenic Trail

The Pacific Crest National Scenic Trail would be managed according to the existing management plan with a 100 feet no-cut vegetation buffer on either side of trail. The BLM lands within a quarter mile of the trail would also be managed under VRM class II objectives to preserve the scenic qualities of the trail environment.

Acquired Lands

Currently there is approximately 160 acres of land near Pilot Rock, T.41S.,R2E.,Section 2, that is in the formal acquisition process (see map 39). If acquired, this land would be included into to the Pilot Rock ACEC. There have been informal discussions over the acquisition of two parcels of land near the north end of the Soda Mountain Wilderness Study Area, T.40S.,R3E.,Sections 28 and 34. If these lands are acquired, the parcel in Section 28 would be managed as LSR and the parcel in Section 34 would be managed as WSA. The WSA boundary would not change as a result of the land acquisition. Other lands that are acquired within the CSEEA boundary, not specifically addressed in the alternatives, would be managed for the purpose which they are acquired or consistent with the management objectives for adjacent lands.

Special Status Species

Special Status Species will be managed according to the Endangered Species Act of 1973, as amended, Bureau Policy and the Record of Decision for the Medford District Resource Management Plan. Special Status Species are plant and animal species which are proposed for listing, officially listed (T/E) or candidates for listing as threatened or endangered by the Secretary of the Interior under the provisions of the Endangered

Species Act (ESA); those listed or proposed for listing by the State, and those designated by each State Director as sensitive.

Issues, Actions and Alternatives Considered But Eliminated From Analysis

Expanding the WSA boundary

The completion of the official wilderness inventory occurred in early 1980. That lead to the Statewide Wilderness EIS and the President's report to Congress, in July, 1992. There is no legal mechanism for considering new wilderness or additions to approved WSAs since there is no post-FLPMA acquired land involved in Soda Mountain WSA, and there were no successful protests or appeals on the WSA inventory "decisions". The BLM has not been directed by Congress or the Secretary of the Interior to prepare a legislative EIS for the expansion of the WSA. The CSEEA Plan/EIS is an administrative EIS. The State Director approves the land use allocation portions of an administrative EIS such as the CSEEA Plan/EIS. Therefore, expanding the WSA was eliminated from this analysis.

Full Recreation Development

The formation of the CSEEA was primarily to maintain, protect, restore or enhance relevant and important value(s). Visitor use must be secondary to the protection of these resources. Alternative E emphasizes opportunities for visitors and complies with the goal of protecting CSEEA resources. The emphasis of recreation over the protection of CSEEA resources is not a reasonable alternative, and is not analyzed further.

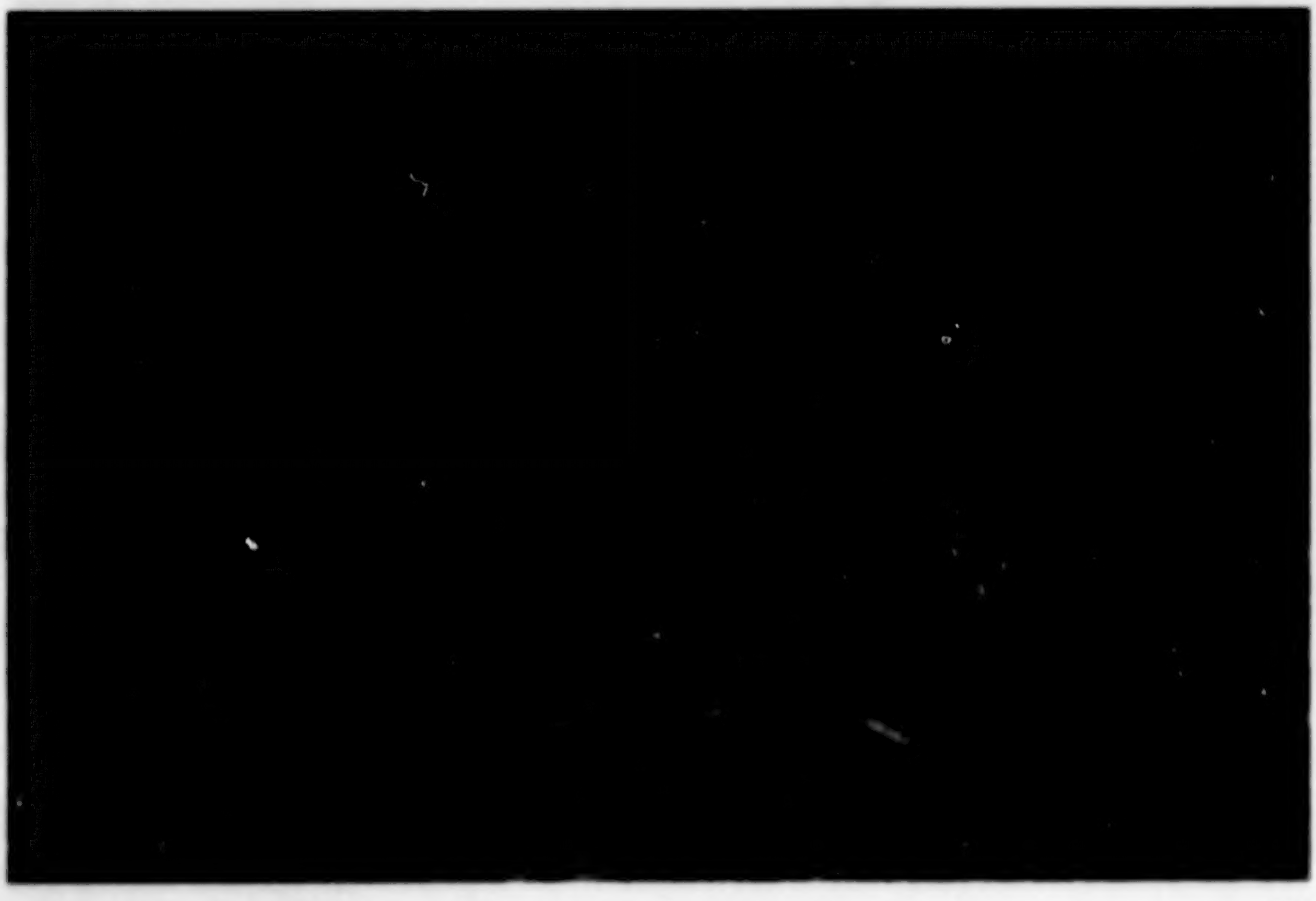
Eliminating Prescribed Fire

The planning team considered developing alternatives that eliminated the use of prescribed fire as a management tool. Because of the importance of fire in natural ecosystem development and the array of management requirements in the different designated land use areas, the team concluded that eliminating prescribed fire was not an option. Under Alternative D prescribed fire has a limited role in achieving ecological objectives but was not be completely eliminated.

Irrigating the Pastures on the Box-O Ranch

During the scoping process the planning team considered the use of pasture irrigation on the Box-O Ranch. However, as a result of low water flows and high stream temperatures in Jenny Creek during the summer months, the team concluded that diverting water from Jenny Creek for irrigation purposes was in violation of the ACS and should be eliminated. Jenny Creek is currently on the Oregon Department of Environmental Quality's 303(d) list as a result of high water temperatures deemed unhealthy for salmonids. Management of the Box-O Ranch would, therefore, institute dry-land pasture management which may mean a conversion of grass species from the current existing pasture grass condition. BLM, in cooperation with Oregon Water Trust, has made application with the Oregon Water Resources Department to transfer the irrigation water rights for the Box-O Ranch to in-stream use for the benefit aquatic resources.

Chapter 4 - Environmental Consequences



Chapter 4 - Environmental Consequences

Introduction

This chapter describes the environmental consequences of implementing any of the five planning alternatives described in Chapter 3. Chapter 4 focuses on the potential impacts on important resources, uses, and activities described under, Existing Conditions, Chapter 2.

- Ecosystem and Landscape Health
- CSEEA Cultural and Biological resources including soils, hydrology, aquatic and riparian resources, wildlife (including special status animal species), vegetation (including special status plant species, weeds, and forest health).
- CSEEA Uses and Users including impacts on livestock operations, forestry product use, recreational use, facilities/rights-of-way and scenic quality.
- Social and Economics including local and regional economies projected from each of the alternatives.

Direct, indirect and cumulative impacts are addressed for each resource, use or activity. Cumulative impacts are the effects on the environment of each alternative when considered with the effects of past, present, and reasonably foreseeable future actions that might occur inside and outside the CSEEA boundary. A tabular summary of these impacts can be found at the end of this Chapter.

Environmental Consequences

Analysis Assumptions and Guidelines

The following assumptions and guidelines were used to guide and direct the analysis of environmental consequences:

1. The alternatives would be implemented substantially, as described in Chapter 3, including the Management Common To All Alternatives.

2. The Bureau of Land Management would have sufficient funding and personnel to implement and enforce the plan.

3. Current trends in recreation use would continue.

4. The planning period for the analysis is the next 15 years at which time the BLM will evaluate the plan and make necessary adjustments. Short-term impacts are those that would occur during the first five years of plan implementation. Long-term impacts are those that would occur beyond the first five years.

5. Specific actions to protect human life would be taken regardless of the management criteria in the plan alternatives.

6. Livestock grazing would continue to be governed by applicable laws and regulations.

7. Research and monitoring would be funded.

8. The Aquatic Conservation Strategy and Best Management Practices (RMP, Appendix D) are common to all alternatives.

Ecological Processes and Landscape Health

Landscape-level criteria affecting ecosystem health include; late-seral conifer continuity, late-seral conifer fragmentation, and percentage acute disturbance within the range of existing plant communities. Equally important are the relative dominance of active processes (fire, timber harvest, livestock grazing) and the characteristics of their actions (frequency, patch size, severity, and pattern). The following text and table 4-1 summarizes how the proposed alternatives might influence these landscape criteria. The direction of the trend associated with the alternatives are presented in table 4-2.

The conifer component of the analysis area is dominated by the mid-seral condition on public land. Conditions on private land generally contribute less to mid-seral and late-seral conifer abundance. This requires an examination of how boundary and management changes might effect the long-term dispersal of conifer-dwelling organisms across the CSEEA landscape. How alternatives address changes in boundaries of land use allocations affecting the balance of conifer conditions, and the potential acquisition of private lands within the checker-board land ownership pattern of the Jenny Creek LSR are important.

It is also important to know if fragmentation is increased or decreased across the landscape following the adoption of an alternative so that biologists and ecologists can envision how fragmentation and edge effects, both in terms of plant environment and wildlife interaction (e.g. predation by cowbirds, and other predators), affect proper ecosystem functioning.

Silviculture is an integral and currently the dominant force of forest health management. Ecologists consider fire to be an integral part of the historical ecosystem over the entire landscape. Increasing use of fire to attain the same objectives of forest health would facilitate the reintroduction of fire as an ecosystem process.

Cultural Resources

Proposed management activities having the potential to effect cultural resources are: off-highway vehicle use, timber harvest, focused/intensive grazing, burning, trail and road building, and road decommissioning. Adverse effects to archaeological/ historical sites is most easily mitigated through site avoidance. Where avoidance is not possible or practical, scientific study of the affected sites may mitigate the anticipated damage to them. Scientific study requires further consultation with concerned Native American groups and other interested parties, and may require consultation with the State Historic Preservation Office and the Advisory Council on Historic Preservation. Since scientific study usually involves excavation, it may also require further environmental review to assess the effects on other aspects of the environment. When there are conflicts between the need to mitigate damage to sites through excavation and the need to protect other values, adverse effects to sites might occur.

Potential Effects by Action

Off-Highway Vehicle Use: Off-highway vehicle use is currently heaviest in the southeastern portion of the CSEEA which also has the highest density of archaeological sites. This area is flat and comparatively open; OHV use takes place throughout the area

Table 4-1. Current and Desired Future Conditions for Landscape Criteria

Landscape Criteria	Current Condition	Historic Processes: Desired Future Condition
Late-Seral Conifer Continuity	Past timber harvest activities and stand replacement wildfire have altered historical late seral conifer abundance and continuity	Conifer continuity maintained and enhanced consequent to predominance of low severity (non-stand replacement) disturbance
Late-Seral Conifer Fragmentation	Pattern of land ownership and timber harvest practices break late seral conifer community into small and temporally static patches	Land ownership pattern and management reduce fragmentation and favor conifer continuity spatially and temporally
Percent Acute Disturbance	Disturbance regime and management practices result in an accumulation of acute disturbance across the landscape	No new long-term acute disturbance (heavy machinery on fragile soils, new roads, clearcutting)
Recovery of Current Acute Disturbance	Acute disturbance accumulates across the landscape	Active restoration of past acute disturbance
Reintroduction of Fire as an Ecosystem Process	Fire used as silvicultural tool only - reduce slash	Fire is used with silviculture to attain healthy ecosystem
Disturbance Patch Size	Location and size of disturbance determined by land ownership	Disturbance patch size match historical patch size and forest health objectives
Frequency of Disturbance (fire and silviculture)	Disturbance frequency matches availability of merchantable trees	Disturbance frequency matches maintenance of healthy ecosystem
Disturbance Severity	Clear-cutting practices and road building result in an accumulation of acute disturbance	Low severity disturbance predominates across the landscape
Private Land Acquisition for Maintaining Rare and Functionally Important Plant Communities	Many rare and functionally important plant communities are not included within the current CSEEA boundaries	Alter the borders and acquire private lands from willing owners to ensure the maintenance of rare and functionally important plant communities
Maintenance of Rare Plant Communities	the full range of plant communties (a component of biological diversity) are maintained by natural ecological processes	All management tools used for maintenance of rare plant communities.
Practice Adaptive Management including; Pilot Studies, Multiple Treatments, Monitoring within Fixed Plots, and Landscape-level Biological Surveys	Annual budgets and lack of funding frequently do not allow the luxury of pilot studies, permanent monitoring plots, and landscape surveys	Practice adaptive management and make use of local educational institutions & students to complete studies; look towards grant writing to fund monitoring across fiscal years

Table 4-2. Trends toward Desired Condition for Landscape-Level Criteria identified in table 4-1.

Landscape Criteria	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Late-Seral Conifer Continuity consequent to CSEEA boundary changes	D	D	I	I	U
Late-seral Conifer Continuity consequent to private land acquisition	U	D	I	I	U
Late-seral Conifer Fragmentation	D	D	I	I	D
Percent Acute Disturbance	D	D	I	I	D
Recovery of Current Acute Disturbance	U	D	I	I	D
Reintroduction of Fire as Ecosystem Process	U	D	I	D	U
Disturbance Patch Size	U	U	I	D	U
Frequency of Disturbance (fire and silviculture)	U	D	I	D	D
Disturbance Severity	U	D	I	D	U
Private Land Acquisition for Maintaining Rare and Functionally Important Plant Communities	U	D	I	I	D
Maintenance of Rare Plant Communities	U	D	I	D	D
Practice Adaptive Management including: Pilot Studies; Multiple Treatments; Monitoring	U	D	I	I	D

D = Decline I = I U = Unaffected

regardless of designated roads. OHV use is severely and adversely impacting archaeological sites by displacing surface materials, churning subsurface soils, and disrupting the archaeological context, thus causing irretrievable loss of archaeological information at affected sites. These effects are aggravated by use when soils are wet and malleable. Avoidance of future effects to archaeological sites may be possible through careful route design and seasonal closures. However, it is difficult to control OHV use off designated routes; consequently unintended effects to archaeological sites from unauthorized use are likely.

Due to the number and density of archaeological sites in the area, mitigation of effects to archaeological sites through scientific investigation would be a major undertaking requiring phased archaeological study over several years and consultation with numerous groups, individuals, and agencies. Should consultation reveal legitimate concerns on the part of concerned Native American groups, according to cultural resource law and regulation, scientific study and excavation of sites may not be sufficient or appropriate to mitigate effects to the archaeological sites, and adverse effects would be likely.

Grazing: Dispersed grazing does not constitute an effect on archaeological resources, except for locations where specific land disturbing developments (e.g. spring improvements, fencing) are initiated. Where grazing activity is not dispersed, but is focused and intensive, such activity may affect archaeological sites through trampling, churning of soils, and displacement of archaeological materials. Impacts from this type

Table 4-3. Potential for Adverse Effects to Cultural Resource

Alternative	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Grazing	L	L-M	L-M	L	L
Timber	L-M	L-M	L	L	L-M
Roads	L-M	L-M	L-M	M	L-M
OHV	H	H	L-M	N	M-H
Recreation	M	M	M	L	M
Burning	L	L	L	L	L
Minerals	L-M	L-M	N	N	L-M

L = low M = medium H = high N = no impact

of grazing may be avoided through project design which avoids archaeological sites. In the following table 4-3, slightly greater potential impacts are assigned to those alternatives with more focused and intensive grazing.

Timber harvest: Timber harvest has the potential to affect archaeological sites through direct impacts to sites. Such impacts may be mitigated by designing projects to avoid archaeological sites.

Roads: Road construction as well as road decommissioning or obliteration may affect archaeological sites through displacement of subsurface materials and destruction of archaeological context. Direct effects to sites from these activities will need to be mitigated through project redesign or scientific study. In the following table, slightly higher potential impacts are assigned to those alternatives calling for increased road decommissioning, obliteration, or construction.

Recreation: Archaeological sites in the CSEEA currently suffer from unauthorized collecting, which removes significant artifacts from the surface of sites and depletes the archaeological value of those sites. Increased recreational use of the CSEEA, especially in those areas with a high density of sites, will increase this adverse impact to sites.

Burning: Fire is not likely to affect most of the archaeological sites in the CSEEA. The remaining historic structures at the Box-O Ranch, as well as other wooden structures in the CSEEA, should be avoided during controlled burns. When avoidance is not possible, impacts may be mitigated by thorough documentation of the historic structure.

The potential for cumulative adverse effects is summarized in Table 4-3 by taking into account the possibility for mitigation of effects through site avoidance.

Soils

The majority of the soils within the boundary of the proposed CSEEA are influenced by montmorillonitic clays, have high rock content and/or are shallow in depth (see Chapter 2 for details). These soil characteristics make the CSEEA very vulnerable to impacts from management activities and recreational use. Two main concerns will be addressed when describing the effects of the alternatives to the soil resource: soil erosion and soil productivity.

Soil erosion is the detachment and movement of soil by water, wind, ice or gravity. Erosion is a natural process that uses these same forces to form soil from rock in the process known as weathering. Soil erosion is of concern when it accelerates, moving soil particles off a site faster than they can accumulate from the weathering of rock. Two detrimental actions occur when soil erosion by water is accelerated. First, eroded soil particles, especially clay particles, often become suspended in water forming sediments that affect water quality. Second, soil decreases in depth when the soil profile loses more particles than it accumulates. Soil productivity decreases in shallow soils as a result of diminished water holding capacity and rooting space available for plant growth.

Nutrient recycling is another soil productivity concern. It is important that nutrients contained in organic matter, available from needle/leaf fall, plant and animal mortality, animal fecal matter, etc., be consumed and assimilated by insects and soil organisms and returned to the soil. Soil nutrient recycling is very important to the soil health, and the plants and animals that depend on it. Soil and plant communities form a symbiotic relationship. When a particular plant community becomes established on a site, a specific group of microorganisms dominate the soil. These organisms become very efficient at recycling plant material and organic matter created by that plant community. Generally, the healthier the plant community, the healthier the soil and vice-versa. This soil-plant relationship can grow and change slowly overtime. As the plant community matures and produces more organic material, the soil organism population increases and recycles more nutrients back to the plants. This process continues until a disturbance agent, such as fire, insect infestation, human activities, etc., breaks the cycle. At this point the soil-plant relationship becomes unbalanced and soil organism types and number are affected.

The proposed alternatives will have an effect on soil erosion and soil productivity. The baseline against which Alternatives B-E will be measured is Alternative A (No Action). No action, in this case, means that management direction and associated effects to the soil resource would not change from that described in the Medford District RMP.

Alternative C and D would have positive effects to the soil resource while Alternatives B and E would result in increased negative effects when compared to Alternative A. Alternative B would have slightly greater negative effects to the soil resource as more activities promoting commodity production would occur. The extraction of natural resource commodities often results in the removal from a site of plant material such as timber or grass. The removal of plant material reduces the organic matter that could be recycled into the soil thus decreasing soil productivity. Livestock grazing does add organic matter back to the soil in the form of animal feces but may result in a net loss to the system. Not all of the activities, such as tree thinning, would have long-term negative impacts but most would involve soil surface disturbance which usually results in short-term negative impacts to the soil.

Alternative C would have slightly positive effects to the soil resource when compared to Alternative A. An emphasis on improving the transportation system reduces the soil erosion potential particularly on natural surface roads. The potential for decommissioning some roads would put land back into producing vegtation and stabilizing the landscape. Limiting new road construction minimizes soil disturbance. Confining OHV use to designated roads does not change the practice from Alternative A especially when enforcement resources are limited. It is apparent from newly created OHV trails that confining (or limiting) OHVs to designated roads is very difficult. The effects of livestock grazing on soil as a result may change slightly from the current practice depending on the definition of "ecological objectives." Livestock managers may contend that grazing is already managed for ecological objectives. The effects of timber management activities to the soil resource may slightly improve as a result of

Alternative C. Alternative C would limit some access for fire suppression activities slightly increasing the chance of large wildfires with high intensity which could be detrimental to the soil resource.

Alternative D would have the greatest positive effect on the soil resource when compared to Alternative A. This alternative proposes to close and decommission most roads within the CSEEA returning them to near natural condition. The roads that remain open would be surfaced which greatly reduces soil erosion from these sites. Grazing would be permitted only under exceptional circumstances so grazing impacts to the soil resource would be negligible. There would be no timber harvest activities except in the Jenny Creek LSR where understory thinning necessary to achieve LSR objectives may occur. Restoration and reforestation of existing plantations could occur in the Jenny Creek LSR to accelerate these stands toward late-successional forest. Soil impacts as a result of forest management activities would be negligible. OHV use would be prohibited and, if unenforceable, would allow existing trails to stabilize and minimize future disturbance which would have a positive effect on the soil resource. Restoration of plant communities would be emphasized enhancing soil productivity. By limiting access, Alternative D would have the greatest potential for stand replacement fires which could result in detrimental effects to the soil resource.

Alternative E would have the greatest negative affects on the soil resource as it provides for maximum visitor use including OHVs. Alternative E increases the potential for OHV use which could lead to substantial surface disturbance throughout the CSEEA resulting in an increase in erosion rates. This could be very detrimental on wet montmorillonitic clay soils. The positive effect Alternative E has on the soil resource is keeping roads open and maintained for fire suppression access. Stand replacement wildfires would have a detrimental effect to the soil resource and minimizing the fire size and intensity is important to minimizing those effects.

Table 4-4 displays the overall cumulative effects of the alternatives.

Hydrology

Proposed management activities likely to have the greatest affect on the streamflow regime within the CSEEA are grazing, timber harvest, roads, off-highway vehicle use, and mineral development. Table 4-5 shows how the proposed management activities could affect hydrologic processes within the CSEEA. The degree to which these activities affect the peak and low flows varies by alternative. Activities that result in soil compaction or vegetation removal would have the greatest likelihood of increasing the frequency and magnitude of peak flows above natural conditions. Low flows are primarily affected by water diversions for activities such as livestock watering and road operations.

Table 4-6 provides a comparison of the potential adverse effects on streamflows by alternative and proposed management activity. The Aquatic Conservation Strategy and Best Management Practices (RMP, Appendix D) are common to all alternatives.

Table 4-7 shows a comparison between alternatives of the potential for cumulative effects on peak and low streamflows.

Table 4-4. Cumulative Adverse Effects on Soils as a result of Alternatives

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
Moderate	Moderate	Low	Very Low	Moderate

Table 4-5. Potential Changes to Hydrologic Processes due to Proposed Management Activities

Proposed Management Activities	Potential Changes to Hydrologic Processes that Affect Streamflow	Potential Changes to Streamflow
Peak Flows		
Grazing	• Reduced infiltration due to compaction: increases surface runoff, decreases groundwater, and reduces time to reach peak.	• Reduced time to hydrograph peak. • Increased frequency of peak flows. • Increased magnitude of peak flows.
Timber Harvest	• Reduced infiltration (see grazing). • Reduced interception and evapotranspiration: increases groundwater. • Increased snow accumulation in transient snow zone. • Decreased snow melt time in transient snow zone.	• Reduced time to hydrograph peak. • Increased frequency of peak flows. • Increased magnitude of peak flows.
Roads	• Reduced infiltration (see grazing). • Disruption of subsurface flow: increases surface runoff, decreases groundwater, reduces time to reach peak. • Increased snow accumulation in transient snow zone. • Decreased snowmelt time in transient snow zone.	• Reduced time to hydrograph peak. • Increased frequency of peak flows. • Increased magnitude of peak flows.
Off-Highway Vehicle Use	• See roads.	• See roads.
Mineral Development	• See roads.	• See roads.
Low Flows		
Grazing	• Decreased summer streamflow due to water withdrawals for livestock.	• Decreased magnitude of low flows.
Timber Harvest	• No water withdrawal.	• No change.
Roads	• Decreased summer streamflow due to water withdrawals for road construction/maintenance.	• Decreased magnitude of low flows.
Off-Highway Vehicle Use	• No water withdrawal.	• No change.
Mineral Development	• Decreased summer streamflow due to water withdrawals for mineral development.	• Decreased magnitude of low flows.

Table 4-6. Comparison of Alternatives for Potential Adverse Effects on Streamflows

Resource Value Affected	Potential for Adverse Effects on Streamflows by Alternative and Activity				
	A	B	C	D	E
Grazing					
Peak Flows	L-M	L-M	L	VL	L-M
Low Flows	L-M	L	L	VL	L-M
Timber Harvest					
Peak Flows	L	L-M	VL	N	L
Low Flows	NA	NA	NA	NA	NA
Roads					
Peak Flows	L-M	M	L	VL	L-M
Low Flows	L	L-M	VL	N	L
OHV Use					
Peak Flows	L	L	VL-L	N	L
Low Flows	NA	NA	NA	NA	NA
Mineral Development					
Peak Flows	L-M	L-M	N	N	L-M
Low Flows	L-M	L-M	N	N	L-M

NA: not applicable
L: low potential for adverse effects
N: no potential for adverse effects
M: moderate potential for adverse effects
VL: very low potential for adverse effects

Table 4-7. Comparison of Alternatives for Cumulative Effects on Streamflows

Resource Value Affected	Potential for Cumulative Effects on Hydrology by Alternative				
	A	B	C	D	E
Peak Flows	L-M	M	VL-L	VL	L-M
Low Flows	L	L-M	VL-L	N-VL	L

Water Quality

Proposed management activities likely to have the greatest affect on water quality within the CSEEA are grazing, timber harvest, roads, off-highway vehicle use, mineral development, and recreation. Temperature, dissolved oxygen, bacteria/pathogens, and turbidity/sediment are the key water quality indicators for the beneficial uses most sensitive to the proposed activities. Table 4-8 shows how the proposed management activities could affect these key water quality parameters within the CSEEA. The degree to which these activities affect water quality varies by alternative. Activities that result in surface disturbance, riparian vegetation removal, or water contamination would have the greatest likelihood of adversely affecting water quality.

Table 4-8. Potential Changes to Water Quality due to Proposed Management Activities

Proposed Management Activities	Potential changes to Processes that Affect Water Quality	Potential Changes to Water Quality
Grazing	• Riparian vegetation removal: reduced stream shade, increased erosion, and increased channel width-depth ratio. • Streambank disturbance: increased erosion and increased channel width-depth ratio. • Water quality contamination due to livestock in streams.	• Increased temperature. • Decreased dissolved oxygen. • Increased turbidity/sediment. • Increased bacteria/pathogens.
Timber Harvest	• Surface disturbance due to yarding: increased erosion and increased channel width-depth ratio.	• Increased temperature. • Decreased dissolved oxygen. • Increased turbidity/sediment.
Roads	• Riparian vegetation removal due to new road construction: reduced stream shade, increased erosion, and increased channel width-depth ratio. • Surface disturbance due to road construction/maintenance: increased erosion and increased channel width-depth ratio.	• Increased temperature. • Decreased dissolved oxygen. • Increased turbidity/sediment.
Off-Highway Vehicle Use	• Surface disturbance due to OHVs driving on unsurfaced roads during the wet season and driving off existing roads: increased erosion and increased channel width-depth ratio.	• Increased temperature. • Decreased dissolved oxygen. • Increased turbidity/sediment.
Mineral Development	• Surface disturbance due to mineral extraction and associated road building: increased erosion and increased channel width-depth ratio.	• Increased temperature. • Decreased dissolved oxygen. • Increased turbidity/sediment.
Recreation	• Water quality contamination due to inadequate waste disposal by recreational users. • Surface disturbance due to trail building: increased erosion.	• Increased bacteria/pathogens. • Increased turbidity/sediment.

Table 4-9 provides a comparison of the potential adverse effects on water quality by alternative and proposed management activity. The Aquatic Conservation Strategy and Best Management Practices (RMP, Appendix D) are common to all alternatives

Table 4-10 shows a comparison between alternatives of the potential for cumulative effects on water quality.

Table 4-9. Comparison of Alternatives for Potential Adverse Effects on Water Quality

Water Quality Parameter Affected	Potential for Adverse Effects on Water Quality by Alternative and Activity				
	A	B	C	D	E
Grazing					
Temperature/Dissolved Oxygen	L-M	L-M	L	VL	L-M
Bacteria/Pathogens	L-M	L-M	L	VL	L-M
Turbidity/Sediment	L-M	L-M	L	VL	L-M
Timber Harvest					
Temperature/Dissolved Oxygen	L	L-M	VL	N	L
Bacteria/Pathogens	NA	NA	NA	NA	NA
Turbidity/Sediment	L	L-M	VL	N	L
Roads					
Temperature/Dissolved Oxygen	L	L	L	VL	L-M
Bacteria/Pathogens	NA	NA	NA	NA	NA
Turbidity/Sediment	L-M	L-M	L	VL-L	L-M
OHV Use					
Temperature/Dissolved Oxygen	L	L	VL	N	L
Bacteria/Pathogens	NA	NA	NA	NA	NA
Turbidity/Sediment	L-M	L-M	VL	N	L-M
Mineral Development					
Temperature/Dissolved Oxygen	L-M	L-M	N	N	L-M
Bacteria/Pathogens	NA	NA	NA	NA	NA
Turbidity/Sediment	M	M	N	N	M
Recreation					
Temperature/Dissolved Oxygen	NA	NA	NA	NA	NA
Bacteria/Pathogens	L	L	L	VL	L-M
Turbidity/Sediment	VL	VL	VL	N	L

NA: not applicable N: no potential for adverse effects VL: very low potential for adverse effects
L: low potential for adverse effects M: moderate potential for adverse effects

Table 4-10. Comparison of Alternatives for Cumulative Effects on Water Quality

Water Quality Parameter Affected	Potential for Cumulative Effects on Hydrology by Alternative				
	A	B	C	D	E
Temperature/Dissolved Oxygen	L	L-M	VL-L	VL	L-M
Bacteria/Pathogens	L-M	L-M	L	VL	L-M
Turbidity/Sediment	L-M	L-M	L	VL	L-M

Aquatic Resources, Stream Channels, and Riparian Habitat

Maintaining the health and future viability of aquatic resources, stream channels and riparian ecosystems are of major concern to the Bureau of Land Management. This concern has been made apparent by the establishment of the Northwest Forest Plan's Aquatic Conservation Strategy (ACS). As with water resources, several potential management activities within the CSEEA are likely to adversely affect these resources. Most apparent among these are livestock grazing, timber harvest, roads, and off-highway vehicle use.

External Boundary Adjustments

Alternative A and E: All lands, whether in the CSEEA or not, are under the jurisdiction of the Northwest Forest Plan and its Aquatic Conservation Strategy. Lands within the Jenny Creek ACEC are designated to protect and enhance riparian ecosystems. Other lands (LSR, RNA's, matrix) must simply maintain or enhance riparian ecosystems.

Alternative B: Decreasing the acreage of the CSEEA removes a layer of protection for fragile areas including streams, upland springs, and riparian areas. In the best of situations, these areas would improve their condition at a slower rate than those within the CSEEA boundary.

Alternative C: Expansion of the ACEC and LSR boundaries would change the focus of land management in those areas to one that favors the integration of terrestrial landscape management while sustaining riparian, stream, and wetland ecological processes. Inclusion of portions of the East Fork Cottonwood Creek Watershed may not benefit aquatic ecosystem because very little stream corridor is in public ownership.

Alternative D: See 'C'. Also, adding lands with major spring complexes not only protects those springs from future land development, but protects habitat for endemic aquatic mollusks and ensures that those springs continue to provide cool, clear water to the Jenny Creek aquatic ecosystem.

Internal Boundary Adjustments

Alternative A ,B and E: All lands, whether in the CSEEA or not, are under the jurisdiction of the Northwest Forest Plan and its Aquatic Conservation Strategy. Lands within the Jenny Creek ACEC are designated to protect and enhance riparian ecosystems. Other lands (LSR, RNA's, matrix) must simply maintain or enhance riparian ecosystems.

Alternative C: Expanding the ACEC reserve to include the Box-O Ranch ensures that the area is managed with an emphasis on protecting and enhancing riparian and stream ecosystem values.

Alternative D: Internal expansions would include some wetland and stream lands that would ensure that the area is managed with an emphasis on protecting and enhancing riparian and stream ecosystem values.

Grazing

Alternative A: The continued improvement of streamside and wetland riparian areas would occur with fencing and cattle herding programs. Without active management, cattle would negatively impact riparian vegetation, wet seeps, wet meadows and stream banks. Box-O Ranch grazing program will be designed to protect and enhance riparian condition.

Alternative B and E: Managing at "range capacity" would require additional fencing and herding to avoid damage to streambanks, riparian vegetation and wet meadows. It would be costly and difficult to meet the Aquatic Conservation Strategy Objectives. Development of natural springs for stock water may result in impacts to endemic snails. The Box-O Ranch would still have riparian vegetation and wet meadow/water table improvement as its primary objectives, even with increased allowance for commodity production grazing.

Alternative C: Using grazing as a tool to achieve ecological values eliminates the pressure of reaching commodity goals. It would also reduce the number of problems that develop from livestock concentrating in wetland or riparian areas. However, using grazing as a tool may be very important to managing and eliminating noxious weeds (like star thistle) without using herbicides or broadcast burning.

Alternative D: Problems that currently arise across Matrix and LSR lands (e.g. cattle concentrating in wetland areas, removal of wetland or riparian vegetation, streambank degradation) would not occur. Wetland/riparian systems would continue to improve. Livestock could be used to control noxious weeds and achieve other beneficial goals.

Timber/PSQ

Alternative A: Could increase peak flows if large areas are opened up to increased snow accumulation and decreased rain interception (see Hydrology section). This could indirectly reduce spawning gravel accumulation and increase pool scouring. Thinning in Riparian Reserves is not included in the PSQ (See 'Density Management' in this section). Other impacts are covered under 'Transportation.'

Alternative B: See 'A.' Also, harvesting in ACEC's would increase the risk of sediment input into Jenny Creek and its tributaries, create edge effects and concentrate wildlife and habitat within the Riparian Reserves of the Jenny Creek ACEC. This assumes that no commercial logging would take place in Riparian Reserves, however, maintenance of access roads near Riparian Reserves would encourage increased fishing on endemic trout stocks.

Alternative C: See Transportation and Forest Health sections.

Alternative D: See 'Hydrology' Section. Eliminating timber production would reduce the risks of streamflow alteration, soil compaction, slumps, and impacts due to the road transportation network needed to support logging.

Alternative E: See 'A.' Maintenance of access roads near Riparian Reserves would encourage increased fishing on endemic trout stocks.

Transportation

Alternative A and E: Roads in the CSEEA are maintained and are scheduled for improvements (larger culverts, etc). Decommissioned roads contribute an initial surge of sediment to stream systems but will reduce overall sediment input. In riparian reserves, decommissioning restores connectivity between riparian and upland areas and helps restore natural stream shape, streamflow, and stream function. Restricting the use of vehicles on the Box-O Ranch to administrative use only (on existing roads) would continue to protect the wet meadows and fragile upland soils, and would limit public access to endemic fish stocks.

Alternative B: The road improvements (upgrading culverts, controlling erosion, and improving surfacing) would decrease the amount of sediment reaching streams from roads in the CSEEA. Repairing roads in the headwaters of Scotch and Camp Creeks would have positive effects. However, all of these actions would produce short-term sediment inputs. Building more roads would not only cause sediment input from construction but would create additional sediment risks and future maintenance issues. These risks and issues from road construction can be minimized by proper design, location and maintenance. Existing and future roads near streams would encourage greater fishing pressure on endemic trout stocks.

Alternative C: Fewer timber sale projects would probably reduce the amount of log truck hauling on natural-surfaced roads. Unfortunately, reduced funding may negatively affect maintenance of well-traveled roads, so sediment input to streams may continue to be a problem. Otherwise: the improved, closed and blocked roads across the CSEEA would reduce sediment input to streams, reducing a long-term irritant to aquatic animals. Upgrading the lower Jenny Creek crossing (the "Licks") would decrease sedimentation problems. Closing this access road to the public would reduce angling pressure on endemic trout stocks.

Alternative D: The improved, closed and blocked roads across the CSEEA would reduce sediment input to streams, reducing a long-term irritant to aquatic animals. Decommissioned roads contribute an initial surge of sediment to stream systems but reduce overall sediment input. In riparian reserves, decommissioning restores connectivity between riparian and upland areas and helps restore natural stream shape, streamflow, and stream function. However, any remaining roads would need to be maintained; sediment input to streams may continue to be a problem. Blocked or decommissioned roads near streams would result in reduced angling pressure on endemic trout stocks.

Off-Highway Vehicles

Alternative A and B: OHV use would continue to be restricted on the Box-O Ranch. However, the rest of the Jenny Creek ACEC is still at risk from OHV use in the wet seasons on legally opened roads and illegally on closed roads, or riding illegally off road in riparian areas. Riding in the wet season can cause sediment and erosion problems. Riparian vegetation would be affected as OHVs introduce weeds and impact fragile plants. Riparian and wetland areas in the Matrix and LSR would continue to be at risk from OHV use in riparian and stream areas (crossing streams, riding up streams, crossing wetlands). Currently, there are no known OHV problem areas affecting riparian reserves. Newly decommissioned roads may not revert/recover if OHVs use them (illegally) for trails. Also, decommissioned roads can develop erosion problems that go undetected. Angling pressure on endemic trout stocks would increase over time if existing roads near stream corridors remain open to the public.

Alternative C: Impacts in Scotch Creek and the Box-O Ranch would be minimal, allowing improvement of OHV-impacted areas. Impacts to ACEC's, Matrix and LSR land would be somewhat reduced, although the risk of impact from illegal OHV riding (off designated roads) would most likely continue.

Alternative D: The elimination of OHVs would reduce problems that can currently arise (e.g. rutting and erosion on steep stream banks or steep hill slopes that drain into creeks, tracks across fragile wet soils or wetland areas, driving up and through streams, increased turbidity). Decommissioned roads would revert/recover faster without disturbance from OHVs (illegally) looking for trail areas.

Alternative E: See 'A.' In addition, the design of a Backcountry Byway would increase both legal and illegal OHV use with benign and destructive results in the CSEEA area. Increased OHV use would increase problems such as rutting and erosion on steep stream banks or steep hill slopes that drain into creeks, tracks across fragile wet soils or wetland areas, driving up and through streams, and increased turbidity.

Hiking/Non-Motorized Recreation

Alternative A, B and C: Hiking would not affect fish or other aquatic animals, or aquatic habitat. Mountain biking is currently not a problem in the CSEEA, although it could become an issue in the future. Problems caused by mountain biking are similar to those caused by OHVs, (sediment, erosion, and habitat destruction, especially in wet areas) although at a much smaller scale.

Alternative D: Converting some existing roads to trails would decrease sediment risk, but not eliminate it. Protection of streams and wetlands would depend on trail maintenance and whether mountain bikes or stock animals are allowed on the trails.

Alternative E: Developed campgrounds near streams would increase use in these areas and potentially create some problems, like bank erosion or pollution from asphalt runoff. The campgrounds would have to be built outside of the riparian area in order to attain ACS objectives. These developed sites might eliminate other problems, like trampling of riparian vegetation, soap/human waste input (into streams) and indiscriminate driving over wet meadows. Developed hiking trails create small "roads" that are susceptible to erosion problems. They also increase access to susceptible areas like wetlands, bogs and wet meadows. However, other recreation sites would have little to no impact to riparian ecosystems and might provide areas for public education and increased appreciation of the CSEEA area. Developments near streams would result in increased angling pressure on endemic trout stocks.

Forest Health (Trees)

Alternative A, B, C and E: Thinning activity within the Riparian Reserves would only be done to improve riparian and stream habitat. For example, a stand with uniformly-aged young trees might be thinned slightly to encourage some tree size and species diversity as well as understory canopy layering (for riparian habitat improvement and improved nutrient input to stream). Trees that might provide large wood to stream systems would not be removed, and might be added during such a project. Thinning in upland areas can be relatively benign to fish/streams, or it can be risky, depending on many factors. Most problems due to upland thinning would be due to transporting logs on roads and associated road work (see Transportation).

Alternative D: Some riparian areas may lose canopy layering or tree diversity for a long time (several hundred years) as these systems recover at a "natural" pace from management activities of 20 and 30 years ago. Nutrient input into streams may be reduced from current levels or may fail to recover to natural levels for a long period of time. Upland areas may have more trees initially, and may be more susceptible to larger, hotter fires. While these types of fires are certainly within the realm of natural variability, the frequency of these larger, hotter fires may be higher because of fire suppression. These changes across the landscape may alter summer low flows or winter high flows, changing the sediment transport capabilities of streams and ultimately fish and aquatic stream habitat. These fires could also release large quantities of nutrients into streams rather than smaller pulses over time. Because most streams in the CSEEA do not have much nutrient storage capabilities any benefits from this would be lost. In summary, the lack of active management would lengthen the time to achieve the "desired condition" of the riparian areas.

Grass/Shrub/Oak Woodland Restoration

Alternative A, C and E: Because of the open nature of these plant communities, snow accumulation should be higher in these areas than in forests with historically closed canopies. Sediment input from any thinning or burning activities depends on the speed at which the understory thrives or reestablishes after treatment. In some cases, these treatments might provide important nutrients to aquatic systems. Activities on the Box-O Ranch should not preclude the primary goal of restoring riparian and wet meadow conditions.

Alternative B: Sediment input from any thinning or burning activities depends on the speed at which the understory thrives or reestablishes after treatment. Negative impacts of this restoration may be greater due to increased grazing pressure.

Alternative D: See 'thinning'. However, because these are naturally open areas, the changes that might occur would be due to conifer and juniper invasion of these habitats, altering water use and ground water flow into small seeps and wetland areas. This could be mitigated with appropriately managed with prescribed fire.

Private Land Acquisition

Alternative A: Acquiring lands along Jenny Creek would, in some cases, protect and enhance riparian, wetland, wet meadow and ultimately stream conditions. Land tenure adjustments would enable BLM and permittees to reevaluate and redesign land use to the benefit of both aquatic resources and the permittee.

Alternative B: Impacts from activities on some private lands would, in some cases, continue to be more severe than those on public lands, simply because riparian and wetland protection is greater on public than on private lands.

Alternative C and D: The addition of any lands including riparian or wetland habitat would improve conditions for fish and aquatic ecosystems. However, including more stream corridors under public ownership could result in increased public access and increased angling pressure on endemic trout stocks.

Alternative E: See 'B'. By not considering future acquisition of private lands this alternative reduces the potential for riparian and stream channel restoration.

Special Forest Products

Alternative A and B: Limited harvest should ensure no negative impacts to riparian, wetland, and stream systems. Special care should be taken to minimize moss or maple burl harvest in riparian areas.

Alternative C and E: Even though there are no known negative or positive effects to riparian or stream systems from special forest product (SFP) harvest, restricting SFP harvest would ensure that problems, now unforseen, do not arise.

Alternative D: Eliminating SFP harvest would ensure that special plants and habitat are protected and that unforeseen problems do not arise.

Horse/Pack Stock Recreation

Alternative A: Unregulated horse/pack stock oriented recreation can impact wetland and wet meadow areas, spread weeds, and cause erosion on steep hillsides. This activity needs to be monitored and any problem areas corrected. There are currently no known problem areas that are not being restored or protected.

Alternative B and E: Increased access for trailers (from improved road network) would increase horse/stock use and associated problems: e.g., introduction of noxious weeds, over-use of riparian meadows, and trail erosion. Increased access may also result in increased angling pressure on endemic trout stocks.

Alternative C: With options for future restrictions, managers have a tool to protect riparian, wetland and stream systems should a problem arise.

Alternative D: Any problems that can currently arise with horse/pack stock use would be curtailed and should not pose any problems to stream and aquatic systems.

Minerals

Alternative A, B and E: Except in ACEC areas, streams would be at risk from bank degradation, channel disturbance, turbidity, sediment inputs, removal of riparian vegetation, increased temperatures, and other water quality issues common with many types of mineral extraction.

Alternative C and D: Withdrawing the CSEEA from mineral entry would protect streams from bank degradation, channel disturbance, turbidity, sediment inputs, removal of riparian vegetation, increased temperatures, and other water quality issues common with many types of mineral extraction. Withdrawal of mineral entry would prevent associated impacts to aquatic organisms.

Wildlife

Analysis of the effects of each alternative on each species of wildlife known or suspected to occur in the CSEEA is not practical. To compare alternatives, sensitive and special interest species known or suspected to occur in the CSEEA analysis area are the focus of the effects analysis for wildlife. The animals on the Special Status Species (SSS) list represents a wide variety of habitat needs. In this analysis these species serve as surrogates for other more common species.

The decision to expand or contract the CSEEA boundary, and by what amount, will be a major outcome of this EIS process. Alternatives C and D both expand the CSEEA, Alternative D more substantially than Alternative C. Generally, better wildlife conditions will result from the larger ecological emphasis area.

Proposed management activities likely to have the greatest affect on wildlife in the CSEEA analysis area are: grazing, timber harvest, roads, OHV use, mineral development, prescribed fire, wildfire suppression activities, and non-motorized recreation. Some of these activities have direct effects on wildlife, most have either short or long term effects on wildlife habitats. Changing the habitat characteristics on a given piece of land will benefit some species and be detrimental to other species. In any change in habitat conditions there will be "winners" and "losers". Whether a species wins or loses depends on what its habitat was like to begin with and how it was changed. The following table 4-11 displays the habitat parameters likely to be affected by each proposed management activity, and how the habitat might be changed.

The following table 4-12 provides a comparison of the expected effects of the 5 alternatives on the special status and special interest species known or suspected to occur in the analysis area. Alternative A, "no action," is the baseline to which the other 4 alternatives are compared. The table summarizes the overall effect that Alternatives B-E are expected to have on the special status and special interest species in the CSEEA, not on the species as a whole across the entire species range. The alternatives are complex and in some cases one component of an alternative may be beneficial for a

Table 4-11. Effects to Wildlife Habitat Parameters

Management Activities With Potential for Affecting Changes in Habitat Quality	Habitat Parameters Likely to be Affected	Potential Changes in Habitat Parameters
Grazing	1. Forage for deer and elk 2. Nesting cover for ground nesting wildlife. 3. Soil compaction in riparian zones 4. Riparian zone shrubs 5. Hiding cover for small animals 6. Weeds	1. Livestock can compete with wildlife for forage. Livestock can "condition" grasslands for better fall and spring "green-up" . 2. Livestock can consume and/or trample grasses used by ground nesting wildlife. 3. Livestock can compact soil in pond turtle nesting areas making nest construction difficult. Livestock can crush/buried Pond Turtle nests. 4. Livestock can consume, destroy, or prevent the re-establishment of riparian shrub communities. 5. Livestock can consume or prevent the re-establishment of thick, tall grass used by many wildlife species. 6. Invading plant seeds can spread into new areas by being carried in on the fur, hooves, and in the gut of livestock. These invaders can propagate in disturbed areas created or maintained by livestock. The invading plants are often of less forage value than natives. The burs of some invading species can cause mechanical damage to the fur and skin of animals

Table 4-11. Effects to Wildlife Habitat Parameters

Management Activities With Potential for Affecting Changes in Habitat Quality	Habitat Parameters Likely to be Affected	Potential Changes in Habitat Parameters
Timber Harvest	1. Canopy Closure 2. Stand Structural Diversity 3. Stand Species mix 4. Snag Density 5. Down wood 6. Sound/Noise 7. Stand Density 8. Microclimate 9. Weeds 10. New roads	1. Timber harvest can reduce canopy closure. 2. Timber harvest can reduce stand structural diversity in both the short and long term. Timber harvest can increase stand structural diversity in the long term. 3. Timber harvest can alter stand species mix. 4. Timber harvest can reduce snag density both short and long term. 5. Timber harvest can reduce the availability of down wood both short and long term. Timber harvest can increase the availability of down wood both short and long term. 6. Timber harvest can increase noise disturbance in the short term. 7. Timber harvest alters the density of stands. 8. Timber harvest can alter the microclimate in stands. 9. Seeds of non-native invading plants can be carried into new areas by logging equipment. These invaders can propagate in disturbed areas created by logging equipment. 10. Timber harvest often involves new road construction. (see roads below) 11. Timber harvest can help prevent catastrophic loss of habitat by wildfire or insect infestation through density management regimes.

Table 4-11. Effects to Wildlife Habitat Parameters

Management Activities With Potential for Affecting Changes in Habitat Quality	Habitat Parameters Likely to be Affected	Potential Changes in Habitat Parameters
Roads	1. Direct impacts EG: vehicles killing animals. 2. Security/ Hiding Cover 3. Dispersal suitability 4. Vegetation 5. Competition with non-native species. 6. Snags	1. Open roads provide vehicle access into wildlife habitat. Vehicles hit and kill wildlife. 2. Open roads provide humans access into otherwise relatively undisturbed habitats. 3. Roads can present barriers (either real or perceived) to some species of wildlife. 4. Invading plants can spread into new areas by propagating along road-side disturbed areas. 5. Non native animals such as cattle and opossums often use roads as travel routes to invade new areas. 6. Snags and trees with structural defects along roads are often removed officially as hazards or unofficially by firewood cutters.
OHV Use	1. Direct impacts eg , vehicles killing animals. 2. Security/ Hiding Cover 3. Weeds	1. OHV's provide vehicle access into wildlife habitat. Vehicles hit and kill wildlife. 2. OHV's provide human access into otherwise relatively undisturbed habitats. 3. Non-native invading plants can spread into new areas by seeds being carried on OHV's. These seeds can propagate in disturbed areas created or maintained by OHV's.
Mineral Development	1. Roosting/Nesting Substrate 2. Canopy Closure 3. Sound/Noise 4. New roads 5. Security/ hiding cover	1. Mineral extraction can destroy cliffs and rock outcrops. 2. Mineral extraction can result in decreased canopy closure. 3. Mineral extraction can result in increased noise. 4. Mineral extraction often results in new road construction. (See roads above) 5. Mineral extraction can increase the disturbance and harassment of wildlife by humans in otherwise relatively undisturbed areas.

Table 4-11. Effects to Wildlife Habitat Parameters

Management Activities With Potential for Affecting Changes in Habitat Quality	Habitat Parameters Likely to be Affected	Potential Changes in Habitat Parameters
Prescribed Fire	1. Canopy closure 2. Vegetation 3. Snags 4. Down wood 5. Stand Species Mix 6. Hiding cover for small mammals 7. Brush/grass habitat condition 8. Direct loss of Wildlife	1. Prescribed fire can reduce canopy closure in the understory and/or over story. 2. Prescribed fire can alter the herbaceous layer species composition and density. 3. Snags can be lost (burned up or felled) during prescribed burns. Snags can be created by prescribed burns. 4. Prescribed fire can result in loss of down wood in the short term. Prescribed fire can result in mid and long term increases in down wood. 5. Repeated use of prescribed fire can result in long term shifts in stand species composition. 6. Prescribed fire can remove tall grass and brush 7. Prescribed fire can rejuvenate grass/brush habitats 8. Prescribed fire can kill wildlife
Wildfire Suppression Operations.	1. Snags 2. Weeds 3. New Trails 4. Habitat mix at the landscape level 5. Protection of wildlife from direct loss	1. Snags can be lost when felled as hazards. 2. Seeds of non-native invading plants can be carried into new areas by fire fighting equipment. These invaders can propagate in disturbed areas created by firefighting equipement. 3. Fire control lines can become unofficial OHV trails. (See OHV use above) 4. Wildlife suppression can maintain the current habitats on the landscape in the short term by minimizing loss to wildfire. Wildfire suppression disrupts the disturbance process that is essential for maintenance of some habitat types in the long term. 5. Wildfire can kill wildlife.

Table 4-42. Overall Effects of Alternatives on Special Status and Special Interest Species

Species Affected	Alt. B	Alt. C	Alt. D	Alt. E
Birds				
Bald Eagle	=	=	=	=
Peregrine Falcon	-	+	+	- -
Lewis Woodpecker	=	=	=	=
Greater Sandhill Crane	=	=	+	=
Northern Saw-whet Owl	-	=	+	=
Western Meadowlark	-	+	+ +	=
Western Bluebird	+	=	-	=
White Pelican	=	=	=	=
Northern Spotted Owl	-	+	+	=
Golden Eagle	-	=	+	=
Northern Goshawk	-	=	+	=
Great Gray Owl	-	=	+ +	=
White- Headed Woodpecker	-	+	+	=
Black-backed Woodpecker	-	+	+	=
Northern Three-toed Woodpecker	-	+	+	=
Pileated Woodpecker	-	+	+	=
Flammulated Owl	-	+	+	=
Pygmy Nuthatch	-	+	+	=

Table 4-12. Overall Effects of Alternatives on Special Status and Special Interest Species				
Species Affected	**Alt. B**	**Alt. C**	**Alt. D**	**Alt. E**
Reptiles and Amphibians				
Western Pond Turtle	=	+	+	=
Cascade Frog	=	+	+	=
Tailed Frog	=	+	+	=
California Mountain Kingsnake	–	+	+	
Common Kingsnake	–	+	+	–
Mammals				
Fisher	–	+	+	–
American Marten	–	+	+	–
Pacific Pallid Bat	–	+	+	–
Townsend's Big-Eared Bat	=	+	+ +	–
Fringed Myotis	–	+	+	=
Terrestrial Mollusks (slugs and land snails)				
Helminthoglypta hertleini	=	=	=	=
Megomphix hemphilli	–	+	+ +	=
Monadenia Chaceana	–	+	+ +	=
Trilobopsis tehemana	–	+	+ +	=
Prophysian dubium	–	+	+ +	=
Prophysian coeruleum	–	+	+ +	=
Special Interest Species				
Black-tailed Deer	–	+	+ +	– –
Roosevelt Elk	–	+	+ +	– –

= :	Expected effects of this alternative are identical or very similar to those of the baseline alternative (A).
+ :	Expected effects of this alternative are beneficial above the conditions provide by the baseline alternative.
+ + :	Expected effects of this alternative are beneficial above the conditions provide by the baseline alternative, and better than other alternatives marked with a single "+".
– :	Expected effects of this alternative are more detrimental to the species than those expected under the baseline alternative.
– – :	Expected effects of this alternative are more detrimental to the species than those expected under the baseline alternative, and more detrimental than other alternatives marked with a single "–"

species and another component of the same alternative could be detrimental to the same species. This table summarizes the over all effect each alternative is expected to have considering all of the provisions of each alternative. All indicators in the table show that an alternative is beneficial or detrimental relative to the baseline of Alternative A.

The following paragraphs describe the effects of the various alternatives on the special status wildlife of the CSEEA analysis area. Only cases where the effects of an alternative are expected to differ from the effects of the baseline no action alternative (A) will be discussed in detail.

Birds

Bald Eagle

There is no expected difference in the effects on this species of alternatives B-E. The expected effects of alternatives B-E are the same as those for alternative A, the baseline no action alternative.

Peregrine Falcon

Alternative E would have negative effects on this species because access roads in the vicinity of potential nesting habitat would remain open, their use would be encouraged and trails and other recreational facilities would be developed in the area near potential nesting sites. This species is very sensitive to human disturbance during the breeding season. Alternatives C and D would both be beneficial to this species because existing roads in the vicinity of potential nesting habitat would be closed and/or decommissioned.

Lewis Woodpecker

There is no expected difference in the effects on this species of alternatives B-E. The expected effects of Alternatives B-E are the same as those for Alternative A, the baseline no action alternative.

Greater Sandhill Crane

Alternative D would provide benefits to this species above those in Alternative A because specific parcels of land containing habitat for this species are identified for acquisition as available from willing sellers. Under this alternative, these lands would be incorporated into the Jenny Creek ACEC as acquired.

Northern Saw-whet Owl

Alternative B is expected to have a negative effect on this species due to the heavy emphasis on timber production on the matrix lands as well as other allocations (ACECs and RNAs) which are not available for harvest under Alternative A. Alternative D is expected to have a positive effect on this species because there would be fewer open roads and less timber harvest than in alternative A.

Western Meadowlark

Alternative B is expected to have a negative effect on this species due to the heavier emphasis on livestock grazing. This species nests on the ground in tall grass. Grazing impacts this habitat type. Alternatives C and D would be beneficial to this species because there would be less grazing, and the limited grazing allowed would be more controlled. Alternative D would be more beneficial because grazing would be less than in Alternative C and there would be fewer open roads than in Alternative C.

Western Bluebird

Alternative D is expected to have a negative effect on this species because the preferred habitat type would be slowly lost to successional processes and forest development.

The expansion of the LSR at the expense of the matrix under this alternative would limit the amount of open, early seral habitat created by timber harvest. It is expected that this species would benefit from alternative B because the early seral open edge habitat type preferred by this species would be maintained by the heavy emphasis on timber harvest in this alternative. This is based on the assumption that the harvest activity would leave behind sufficient snags and cavity trees for nesting sites.

White Pelican

There is no expected difference in the effects on this species of alternatives B-E. The expected effects of alternatives B-E are the same as those for alternative A, the baseline no action alternative.

Northern Spotted Owl

Alternative B is expected to have a negative effect on this species due to the heavy emphasis on timber production on the matrix lands as well as other allocations (ACEC and RNA) which are not available for harvest under Alternative A. Alternatives C and D are expected to have a positive effect on this species because there would be fewer open roads and less timber harvest than in Alternative A. Both alternatives reallocate matrix lands to other classifications; Alternative D to LSR, Alternative C to a Forest Health Reserve. Alternative D is expected to be somewhat more advantageous than Alternative C because the management of the newly designated Jenny Creek LSR land would be managed specifically for late-successional characteristics as opposed to forest health in Alternative C. Also, Alternative D would have fewer open roads than Alternative C. The expansion of the LSR under Alternative D would bring an additional 4 spotted owl pair sites into the LSR designation. This would bring the number of pair sites in the Jenny Creek LSR up to 21. Alternative D would be a major step in achieving regional the objectives for the LSR.

Golden Eagle, Northern Goshawk, Great Gray Owl, White-headed Woodpecker, Black-backed Woodpecker, Northern Three-toed Woodpecker, Pileated Woodpecker, Flammulated Owl

Alternative B is expected to have a negative effect on these species due to the heavy emphasis on timber production on the matrix lands as well as other allocations (ACEC and RNA) which are not available for harvest under Alternative A. Alternatives C and D are expected to have a positive effect on these species because there would be fewer open roads and less timber harvest than in Alternative A. Both alternatives reallocate matrix lands to other classifications; Alternative D to LSR, Alternative C to a Forest Health Reserve. Alternative D is expected to be somewhat more advantageous than Alternative C because the management of the newly designated LSR lands would be managed specifically for late-successional characteristics as opposed to forest health in Alternative C. Also, Alternative D would have fewer open roads than Alternative C.

Reptiles and Amphibians

Western Pond Turtle

Alternatives B is expected to have a negative effect on this species due to the heavy emphasis on grazing. Alternative E is expected to have a negative effect on this species due to the increased number of people in the area, and increased vehicle traffic. Road kill and collection by humans are threats to this species. Alternatives C and D are expected to have beneficial effects on this species because of the expansion of the Jenny Creek ACEC, reduced grazing, and fewer open roads.

Cascade Frog and Tailed Frog

Alternatives C and D are expected to have beneficial effects on this species because of the expansion of the Jenny Creek ACEC, reduced grazing, and fewer open roads.

California Mountain Kingsnake and Common Kingsnake
Alternatives B is expected to have a negative effect on these species due to the heavy emphasis on grazing. Alternative E is expected to have a negative effect on this species due to the increased number of people in the area, and increased vehicle traffic. Road kill and collection by humans are threats to these species. Alternatives C and D are expected to have beneficial effects on these species because of the reduced grazing, and fewer open roads.

Mammals

Fisher, American Marten Pacific, Pallid Bat and Fringed Myotis
Alternative B is expected to have a negative effect on these species due to the heavy emphasis on timber production in the matrix lands as well as in other allocations (ACEC and RNA) which are not available for harvest under Alternative A. Alternatives C and D are expected to have a positive effects on these species because there would be fewer open roads and less timber harvest than in Alternative A. Both alternatives reallocate matrix lands to other classifications; Alternative D to LSR, Alternative C to a Forest Health Reserve. Alternative D is expected to be somewhat more beneficial to this species than Alternative C because the management of the newly designated LSR lands would be managed specifically for late successional characteristics as opposed to forest health in Alternative C. Also, Alternative D would have fewer open roads than C.

Townsend's Big-eard Bat
Alternative E is expected to have negative effects on this species because of the increased human activity near potential roost sites at Pilot Rock and the Cathedral Cliffs. Alternatives C and D are expected to have a positive effects on this species because there would be fewer open roads than in Alternative A. Alternative D would have fewer open roads than C.

Terrestrial Mollusks

Helminthoglypta hertleini (land snail)
There is no expected difference in the effects on this species of alternatives B-E. The expected effects of alternatives B-E are the same as those for alternative A, the baseline no action, alternative.

Megomphix hemphilli (land snail), *Monadenia Chaccana* (land snail), *Trilobopsis tehemana* (land snail), *Prophysian dubium* (slug), and *Prophysian coeruleum* (slug)
Alternative B is expected to have a negative effect on these species due to the heavy emphasis on timber production in the matrix lands as well as in other allocations (ACEC and RNA) which are not available for harvest under Alternative A. Alternatives C and D are expected to have a positive effects on these species because there would be less timber harvest than in Alternative A. Both alternatives reallocate matrix lands to other classifications; Alternative D to LSR, Alternative C to a Forest Health Reserve.

Special Interest Species

Black-tailed Deer and Roosevelt Elk
Alternative B is expected to have a negative effect on this species due to the heavy emphasis on timber production in the matrix lands as well as in other allocations (ACEC and RNA) which are not available for harvest under alternative A. Some of the matrix lands have timber stands which provide important thermal cover and security/ hiding cover for this species. Alternative B also emphasizes grazing. Heavy grazing could put deer and livestock in competition for forage. Alternative E is expected to have negative effects on this species because of the increased human activity in the Agate Flat, and other winter range areas. Areas currently difficult to access would be made more

accessible, thus increasing disturbance to the wintering deer. The development of a campground in the middle of winter range, as proposed in Alternative E , would negatively effect the wintering herd. Alternatives C and D would be beneficial to this species because most roads in the winter range areas and many in the summer range areas would be closed.

Vegetation

Grassland, Shrubland, and Woodland Health

Undesired changes in the condition of grasslands, shrublands, and woodlands relative to the historical condition are considered the result of past livestock management, fire suppression, weed invasion, road building, and OHV use.

Past management has allowed a change in the balance of conditions within grasslands, shrublands, and woodlands. In many areas, annual weeds have assumed dominance within the herbaceous component of grasslands, shrublands and woodlands. This is the most damaging plant community change occurring within drier plant communities. Many consider the active maintenance of a native herbaceous understory using all available management tools to be the best strategy for preventing weed invasion.

Fire suppression has likely resulted in a preponderance of woody dominated conditions relative to historical times immediately prior to European settlement. In shrublands and shrub dominated woodlands, such long-term woody canopy retention is associated with a loss in herbaceous understory and seedbank, as well as loss in quality of winter browse. Fire suppression has also resulted in more high canopy oak woodlands dominated by oaks. Understories within these communities appear dominated by native plants. While increased canopy cover by hardwoods goes counter to historical condition, associated improved survival of native understory and reduced invasion by weeds such as starthistle are considered beneficial.

The reintroduction of fire is important from the ecosystem functional perspective (including the nutrient and hydrological cycles) as well as for the maintenance of plant species that are directly dependent on fire for germination and establishment. Fire is therefore considered critical for the management of the CSEEA landscape.

Special Status Plants

Special Status Plants (SSP) also includes Survey & Manage lichens, bryophytes, fungi, and vascular plants in this section.

All management actions could impact SSPs and their habitats including no management action (distinguished from the "no action" alternative). SSPs are found in all the basic habitat types of the CSEEA. Any activity affecting vegetation or substrate has the potential for causing impacts to the species. Direct and indirect impacts vary with activity, land use allocation, plant community, and species involved. Management activities having the greatest impacts on SSPs and their habitats are grazing, timber harvest, transportation, prescribed fire, and fire suppression. While some activities produce immediate adverse impacts, they can also offer long term benefits.

External and internal boundary adjustments, and private land acquisition would have similar effects on SSPs and their habitats. Simplistically, acquisitions or adjustments would be considered a benefit when going from a less protective land use allocation to a more protective one. This would follow the scale of: less to more– private, undesignated Matrix, Box-O Ranch, LSR, ACEC, RNA.

Table 4-13. Current and desired future conditions for grassland, shrubland, and woodland community-level criteria

Disturbance Agent	**Current Process**	**Historic Processes: Desired Future Condition**
Improve fire-induced balance of conditions	Fire suppression has resulted in a landscape of decadent shrubs and the potential loss of fire dependent species	Natural fire and Native American initiated fire maintained a mosaic of communities with a range of fire impacts in terms of age since last fire & fire severity
Maintenance of vigorous native herbaceous understory	Fire suppression, historic grazing practices, weed invasion have all resulted in the deterioration of the herbaceous component of plant communities	Maintaining vigorous native herbaceous understories using all management tools have been identified as the best strategy for minimizing weed invasion and soil erosion
Reduce weed invasion (including annual grasses)	Weed invasion is currently one of the major impacts on non-conifer plant communities. The very act of introducing weeds from other continents may have been enough to trigger the landscape plant community changes seen during the 1900s.	Use of all available management tools for pro-active weed control. Create a monitoring system to critically evaluate management actions.
Protect/enhance semi-wetlands, wetlands, riparian areas	Semi-wetlands, wetlands and riparian plant communities occupy the smallest percentage of the landscape, are functionally one of the most important, and yet are the most highly impacted by past management.	Use of all available management tools to restore these plant communities into functional entities
Recreate oak savanna where feasible	Ecologists maintain that open oak woodlands were more common prior to European settlement. Acorn production may be linked to oak growth-form, tree density, shrub abundance, and nutrient-cycling consequent to fire.	While recreating historical conditions may facilitate weed invasion, opportunities for recreating oak savannas under more benign conditions may exist
Maintenance/restoration of rare plant communities	Fire suppression and other management activities have reduced landscape-level plant community richness	Actively protect or use management tools to maintain and improve landscape-level plant community richness

Table 4-14. Trend towards desired condition for Plant Community criteria identified within table 4-13.

Grassland, Shrubland and Woodland Community Criteria	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Improve fire-induced balance of conditions	D	D	I	D	D
Maintenance of vigorous native herbaceous understory	U	D	I +	I	U
Reduce weed invasion (including annual grasses)	U	D	I +	I	D
Protect/enhance semi-wetlands, wetlands, riparian areas	U	D	I	I	U
Recreate oak savanna where feasible	U	U	I	D	U
Maintenance/restoration of rare plant communities	U	D	I	D	D

D =Decline I = Improve U = Unaffected

Table 4-15 describes effects to Special Status Plants and their habitats based on proposed management activity. Effects were considered across all land use allocations. It is recognized that the general SSP category includes organisms of differing genetics and ecological requirements and responses. All SSP organisms may not react in the same way to a given activity. The table provides a general response estimate to the class of organisms and not necessarily to individual species.

Table 4-16 ranks and compares potential adverse effects to Special Status Plant species and their habitats by proposed management activity. Effects were considered across all land use allocations.

Table 4-17 is a compilation of the alternatives comparison table used to help determine cumulative effects. Effects were considered across all land use allocations and includes all proposed management activities.

Noxious Weeds and Introduced Plants

Noxious weeds and other introduced species alter ecological systems, reduce biodiversity and degrade habitat quality. The change in plant communities species composition is the most obvious effect. Left unmanaged, noxious weeds and introduced plants will often obtain and maintain site dominance. Altering the species composition also changes the physical structure of the plant community. These plants alter soil properties, available soil moisture, the nutrient cycle, and indirectly, the insect and animal populations once established.

Noxious weeds and introduced plants are usually associated with disturbed ground. However, some species can invade undisturbed and managed land in good condition. Management activities with the greatest potential for promoting weed establishment and spread are, grazing, timber harvest, off-highway vehicle use, minerals, and recreation.

Table 4-15. Potential Effects to Special Status Plants or Habitats

Management Activities with Potential for Affecting Special Status Plants or Habitats	**Special Status Plant or Habitat Characteristics Likely to be Affected**	**Potential Effects to Special Status Plants or Habitats**
Grazing	• Browsing and trampling of SSPs. • Browsing and trampling of associated species in SSP Habitats. • Soil disturbance by trampling and congregating. • Mechanical damage to SSP substrates by trampling and abrasion.	• Mortality; prevention of flowering and seed production; reduced vigor of SSPs. • Plant community composition and structure changes, e.g. bunchgrass to introduced annual grasses. • Changes to SSP microclimate. • Loss of plant and animal diversity. • Domination by introduced and/or noxious weed species, i.e. weedy "climax" situation, incl. maintenance of this situation by continued browsing of decreasers. • Loss of pollinators important to SSPs and native vegetation. • Loss of nutrients to the site. • Damage to the organic litter layer including damage to S&M fungi mycelial layer. • Loss of soil structure which reduces soil aeration and soil moisture. • Reduced litter fall which contributes to organic matter and soil development. • Damage to fragile SSP habitats, esp. vernal pool/shallow soils. • Damage to lichen, brophyte, and fungi populations and habitats, esp. tree bases, low limbs, rocks, logs. • Degradation of seedbed for SSPs and native plants, incl. baring the ground to expose seed to predators. • Changes to native vegetation and further degradation of already invaded areas by spread of introduced species and/or noxious weeds through seed transport and ground disturbance.

Table 4-15. Potential Effects to Special Status Plants or Habitats

Management Activities with Potential for Affecting Special Status Plants or Habitats	Special Status Plant or Habitat Characteristics Likely to be Affected	Potential Effects to Special Status Plants or Habitats
Timber Harvest and Forest Health	1) Conifer and hardwood density is reduced. 2) Snags and decaying coarse woody debris are reduced. 3) Ground disturbance occurs. 4) Slash accumulations increase. 5) Mechanical damage to understory occurs. 6) Habitat fragmentation occurs.	1) Changes to solar and precipitation interception from a decrease in canopy closure. 2) Loss of habitat for canopy dwelling lichens from a decrease in canopy closure. 3) Changes to microclimate, e.g. light, temperature, humidity, wind, soil moisture. 4) Forest overstory and understory composition and structure changes. 5) Loss of undiscovered populations of SSP, esp. canopy dwelling and cryptic species. 6) Loss of habitat for fungi, bryophytes, and lichens by snag and CWD removal. 7) Organic litter layer disturbed; function affected. 8) Fungus mycelial zone damaged by machinery. 9) Changes to microclimate beyond directly impacted area by edge effect influence. 10) Loss of SSP habitat, connectivity; increase fragmentation from log skid and transportation roads built. 11) Changes to native vegetation and further degradation of already invaded areas by spread of introduced species and/or noxious weeds through seed transport, ground disturbing operations and new road construction. 12) Long term benefit in LSR by directing current situation to simulate late successional forest habitat. 13. Islands of unsuitable habitat produced.

Table 4-15. Potential Effects to Special Status Plants or Habitats

Management Activities with Potential for Affecting Special Status Plants or Habitats	Special Status Plant or Habitat Characteristics Likely to be Affected	Potential Effects to Special Status Plants or Habitats
Transportation and Facilities/Rights-of-Way	1. Habitat fragmentation occurs. 2. Ground disturbance occurs. 3. Natural water flow is disturbed.	1. Loss of SSP habitat and undiscovered populations from new road construction, incl. skid roads. 2. Roads function as barriers for species with dispersal limitations. 3. Available water for vegetation is redirected by road ditches and culverts. 4. Changes to native vegetation and further degradation of already invaded areas by spread of introduced species and/or noxious weeds through new road construction, road maintenance, and road decommissioning. 5. Collection/picking of SSPs increase with more and better access. 6. Changes to microclimate beyond directly impacted area by edge effect influence. 7. Loss of *Fritillaria glauca* habitat and undiscovered populations by road construction and rock source development in desirable rocky ridgetop locations.
Off-Highway Vehicle Use	1. Mechanical damage to SSPs. 2. Mechanical damage to suitable habitat. 3. Natural water flow is disturbed.	1. Mortality; prevention of flowering and seed production; reduced vigor of SSPs. 2. Changes to native vegetation and further degradation of already invaded areas by spread of introduced species and/or noxious weeds through seed transportation and ground disturbance creating bare soil. 3. Available water for vegetation is redirected by OHV trail. 4. Erosion from precipitation following OHV trails, esp. across contour trails.
Hiking/Non-motorized and Horse/Pack Stock Recreation	1. Disturbed areas increase. 2. Natural water flow is disturbed.	1. Collection/picking of SSPs increase with more and better access. 2. Erosion from precipitation following trails, esp across contour trails. 3. Increase in introduced plant and noxious weed establishment on disturbed ground, by trail users and maintenance crews.
Minerals	1. Mechanical damage to undiscovered SSPs and habitats. 2. Changes to site hydrology.	1. Mortality to undiscovered SSPs. 2. Loss of SSP habitat through site development and new road construction. 3. Available water for vegetation is redirected by site operations and associated roads.

Table 4-15. Potential Effects to Special Status Plants or Habitats

Management Activities with Potential for Affecting Special Status Plants or Habitats	Special Status Plant or Habitat Characteristics Likely to be Affected	Potential Effects to Special Status Plants or Habitats
Grass/Shrub Woodland Communities Restoration	1. Disturbance to SSPs and habitat.	1. Damage to SSPs depending on timing of action. 2. Short and long term benefits by simulating pre-Euro-american fire processes. 3. Habitat is not reclaimed by managing Box O pastures for introduced grass species.
Fire Suppression	1. Disturbance of SSPs and habitat.	1. Mortality; prevention of flowering and seed production; reduced vigor of SSPs by direct physical damage, esp. line building activities. 2. Changes to available nutrients by use of fire retardant. 3. Loss of habitats or substrates by physical disturbance, e.g. falling snags, tractor piling CWD, organic litter layer raking. 4. Changes to native vegetation and further degradation of already invaded areas by spread of introduced species and/or noxious weeds through ground disturbing activities. 5. Long term plant community changes by excluding fire.
Prescribed Fire	1. Disturbance of SSPs and habitat.	1. Mortality; prevention of flowering and seed production; reduced vigor of SSPs by direct physical damage. 2. Loss of habitats or substrates by physical disturbance, e.g. falling snags, incidental burning of CWD, organic litter layer raking. 3. Short and long term benefits by simulating pre-Euroamerican fire processes.

Table 4-16. Comparison of Adverse Effects of Special Status Plant and Associated Habitat

Resource Value Affected	Potential Adverse Effects to Special Status Plant Species and Associated Habitats				
	A	B	C	D	E
Grazing					
SSP Species	M	M	L-M	L	M
SSP Habitat	M	H	L-M	L	M
Timber Harvest and Forest Health					
SSP Species	L-M	M	L-M	L	L-M
SSP Habitat	M	M-H	L	L	M
Transportation and Facilities/Rights-of-Way					
SSP Species	L-M	L-M	L	L	L-M
SSP Habitat	M	M-H	L-M	L	M
Off-Highway Vehicle Use					
SSP Species	L-M	L-M	L	N/A	M
SSP Habitat	L-M	L-M	L	N/A	M-H
Hiking/Non-motorized and Horse/Pack Stock Recreation					
SSP Species	L-M	L	L-M	L	M
SSP Habitat	L-M	L-M	M	L	M
Minerals					
SSP Species	L-M	L-M	N/A	N/A	L-M
SSP Habitat	M	M	N/A	N/A	M
Grass/Shrub Woodland Communities Restoration					
SSP Species	L	L	L	L	L
SSP Habitat	L	L-M	L-M	L	L

N/A= not applicable
L= low potential for adverse effects
M= moderate potential for adverse effects
H= high potential for adverse effects

Table 4-17. Cumulative Effects to Special Status Plants and Associated Habit

Resource Value Affected	Overall Potential for Adverse Effects by Alternative				
	A	B	C	D	E
SSP Species	L-M	L-M	L	L	L-M
SSP Habitat	L-M	M	L-M	L	M

Interspersed private lands compound the problem of weed management. Often, these lands are highly disturbed with established weed populations. Roads and trails passing through infested private land serve as seed sources for vehicles and recreationists to spread. Alternatives that pursue private land acquisition (A, C, and D) would benefit restoration and weed management efforts.

The table 4-18 below provides an overall comparison of the proposed alternatives as they affect weed establishment and also serves to show the cumulative effects of the alternatives.

Forest Health

The management activities that most likely affect overall forest health are timber harvest (thinning) and prescribed fire. These activities change forest structural characteristics at the time of treatment. Disturbance agents are always a factor at the stand and landscape level. Disturbance agents will have various impacts depending on successional stages and plant communities affected. Management activities may aid in decreasing the relative impact of disturbance agents to historic levels over time and over the landscape. A short overview of these processes is provided in table 4-19 and is intended to show the relative impacts on the disturbance processes of proposed treatments. Table 4-20 indicates disturbance agent trends. Table 4-21 indicates overall effects on forest structural characteristics and components species by alternative. Map 17 (insect surveys, 1995-98) and map 44 (laminated root rot) show recent occurrences or presence in CSEEA.

Assumptions made for disturbance agent effects are based on the degree to which activities such as thinning and prescribed burning will occur. Stand structural characteristics change in response to disturbance agents and also determine to what extent a disturbance agent may alter stand development. For instance, lower densities in natural stands generally will result in lower levels of mortality due to beetles. Species composition will determine the extent host specific root rots effect future stand development for another example. Often beetle-pathogen interactions occur together and are affected by density and species composition. Fir engraver/root rot interactions are common in the CSEEA particularly in white fir plant communities and the more mesic higher elevation mixed conifer forest communities where white fir is found. Most of the assumptions pertain to mixed conifer because mixed conifer plant communities make up 93 percent of the forest types found in CSEEA while white fir accounts for 7 percent.

Tree thinning and prescribed burning will be the primary management activities applied across the landscape that will affect forest structure and species composition. Generally, lower stand densities and larger tree size will accompany a shift away from small dense white fir toward larger ponderosa and sugar pine while maintaining other coniferous and hardwood species present. This "species shift" will be toward historical levels.

Table 4-18. Comparison of Alternatives as they Affect Weeds

Resource Value Affected	Overall Potential for Adverse Effects by Alternative				
	A	B	C	D	E
Weed Establishment and Spread	L-M	M	L-M	L	M

L= low potential for adverse effects M= moderate potential for adverse effects

Table 4-19. Disturbance Agents Processes

Disturbance Agent	**Current Processes**	**Historic Processes: Desired Future Condition**
Laminated Root Rot *(Phellinus weirii)*	Ramifies through the stand, large impact due to lack of older structure and resistant species. The organism is on the site indefinitely.	Forms gaps for intolerant species establishment, remains onsite indefinitely, affects only white fir and Doug fir, main disturbance agent in white fir plant communities.
Annosus Root Rot *(Heterobasidion annosum)*	Heavy mortality of susceptible species (white fir) in previously entered stands, opens up stands, reduces basal area, decreases canopy, reduces stand structure.	Low natural levels, forms gaps, stumps treated when stands are entered to discourage spread.
Shoe String Root Rot *(Armellaria mellea)*	Causes mortality of most species particularly in dense stands where trees are stressed. Increased incidence due to logging damage and compaction occurs.	Acts in concert with other root rots at lower levels. Fewer trees are stressed and are then less susceptible to an often secondary pathogen.
Fir Engraver *(Scolytus ventralis)*	Heavy infestations in concert with root rots in dense stands. Risk is increased to larger forest areas.	Forms gaps, found at lower levels due to fewer overly dense stands, natural density reduction occurs. Root rot/ insect interactions occur at lower levels.
Mountain Pine Beetle *(Dendroctonus ponderosae)*	Causes heavy mortality of large mature sugar and ponderosa pine in overly dense mixed conifer stands.	Reduced levels of pine mortality due to decreased stand densities, less water stress and more vigorous trees. Reduced risks to infestation.
Western Pine Beetle *(Dendroctonus brevicomis)*	Causes heavy mortality of large and small ponderosa pine in dense stagnate mixed conifer stands.	Reduced levels of pine mortality due to decreased stand densities, less water stress and more vigorous trees i.e. reduced risk.
Wind; winter storm events and windthrow.	Increased windthrow due to heavy thinnings, previous clearcuts that created wind tunnels and edge effects due to cut stands adjacent to unentered stands i.e. increased exposure.	Random windthrow events still occur, however effects are reduced on intact forests on the landscape.
Catastrophic fire effects	Without prescribed burning: high intensity stand replacement fires due to buildup of ladder fuels, fine fuels, CWD and snags.	With prescribed burning: light intensity mosaic fires which decrease the amount of fuels over the landscape at historic intervals.

Table 4-20. **Relative Trends of Disturbance Agents (effects) in Forest Stands**					
Disturbance Agents	**A**	**B**	**C**	**D**	**E**
Laminated Root Rot (*Phellinus weirii*)	I	I	D	D	D
Annosus Root Rot (*Heterobasidion annosum*)	I	I	D	D	D
Shoestring Root Rot (*Armellaria mellea*)	I	I	D	S	D
White Pine Blister Rust (*Cronartium ribicola*) Not normally considered a disturbance agent, but listed here due to its impact on seedling and pole size sugar pine i.e. young sugar pine are being lost from the stand and being replaced by white fir, Doug-fir and incense cedar in mixed conifer stands.	I	I	D	I	I
Fir Engraver (*Scolytus ventalis*)	I	I	D	D	D
Western Pine Beetle (*Dendroctonus brevicomis*)	I	I	D	D	D
Mountain Pine Beetle (*Dendroctonus ponderosae*)	I	I	D	D	D
Wind (windthrow resulting in tree mortality)	I	I	D	D	D
Wildfire (stand replacing events and tree mortality) **With Prescribed Burning**	I	I	D	D	D

I = increase D = Decrease S = Same

Specifically, historic plant community attributes and current land designations will drive management decisions. Overall trends indicated in Table 4-20 are landscape level trends.

Timber Harvest

The following tables represent the volume, by logging system, that would be removed from the matrix lands on the first entry. They do not included volume from the acres that were not accessible as identified in chapter 2 (Matrix). Timber volume from riparian zones within the Matrix commercial units are also excluded. Timber volumes were computed using existing inventory information and a range of removal for each of the vegetative types and alternatives. Volumes do not include the WSA, Pilot Rock, Scotch Creek, or the Spotted Owl Cores. Timber harvest in the Scotch Creek RNA is allowed in Alternative A and would count toward the PSQ but would be minimal [less than 1 million board feet (MMBF)]. Timber harvest is not analyzed in the Jenny Creek LSR because it does not affect the PSQ and activities are the same for each alternative, except D where timber harvest would not be allowed.

Alternative C has tables 4-24 and 4-25 associated with it. Table 4-24 analyzes timber harvest with a permanent barricade where there is presently a gate in Section 3, T.41S.,R.2E. The other table (4-25) analyzes timber harvest with a permanent barricade farther to the south on the Schoheim Road. Cost analysis indicated that several units could not be economically harvested using an aerial system if the Schoheim Road is blocked at the gate. All units 6,000 feet or farther from a helicopter landing would be too far to economically yard the timber. Approximately 83 acres of younger stands and 202 acres of mature mixed conifer (MC) would not be available for commercial harvested. This would represent approximately 9,200 MBF of stand volume and a first entry harvest level of approximately 1,380 to 2,301 MBF.

Table 4-21. Forest Structural Characteristics and Species Composition(trends) by Alternative

Forest Structural Characteristics		**A**	**B**	**C**	**D**	**E**
Stand Density		I	I	D	D	D
Canopy		I	D	S	I	S
Individual tree vigor		D	D	I	S	I
Average Tree size (Diameter and height)		D	D	I	I	I
Coarse Woody Debris	Large > 16"	S	D	I	I	I
Coarse Woody Debris	Small < 16"	I	I	D	D	D
Snags	Large > 16"	S	D	I	I	I
Snags	Small < 16"	D	I	D	D	D
Dwarf Mistletoe (not a disease that is considered a disturbance agent, but is important wildlife habitat at a stand structural level)		I	I	S	S	D
Species Composition		**A**	**B**	**C**	**D**	**E**
Ponderosa pine		D	D	I	I	I
Sugar pine		D	D	I	I	I
Douglas-fir		S	D	D	S	S
Incense cedar		S	I	S	S	S
White Fir		I	I	D	D	D
Hardwoods		I	I	D	S	D

I = increase D = Decrease S = Same

Table 4-22. Volume by Logging Systems (MBF), Alternatives A and E

	TRACTOR	**CABLE**	**AERIAL**	**TOTAL**
Poles	681-1191	57-100	166-291	904-1582
Mature White Fir	481	776	437	1694
Mature Mixed Conifer	4,872-9743	1,724-3,449	5,785-11570	12,381-24,762
Total	6,034-11,415	2,557-4,325	6,388-12,298	14,979-28,038

MBF = Thousand board feet

Estimated first entry volume removed are based on current prescriptions of timber sales used throughout the Matrix, using the objectives discussed in Chapter 2 (Matrix) and following the guidelines of the Resource Management Plan.

Logging cost were computed using the software *World Logging Costs* for tractor and cable harvesting and the software *Helipace* program for aerial operations. A single pond value of $462.37 per MBF was calculated assuming a harvest species mix of white fir 30 percent, Douglas-fir 50 percent, ponderosa and sugar pine 10 percent and incense cedar 10 percent. Weighted logging costs for each alternative are shown in table 4-27. A value of $167.09/MBF was used for a combined cost for log haul, road costs, post harvest slash treatments and other miscellaneous costs associated with timber harvesting. This value was computed from recent sales in this area.

Table 4-23. Volume by Logging Systems (MBF), Alternative B

	TRACTOR	CABLE	AERIAL	TOTAL
Poles	681-1,191	57-100	166-291	904-1,582
Mature WF	696	1,086	612	2,394
Mature MC	6,496-9,743	2,299-3,449	7,714-11,570	16,509-24,762
Total	7,873-11630	3,442-4,635	8,492-12,473	19,807-28,738

MBF = Thousand board feet

Table 4-24. Volume by Logging Systems (MBF), Alternative C. Schoheim Road Blocked at Gate. No aerial yarding beyond 6000 feet

	TRACTOR	CABLE	AERIAL	TOTAL
Poles	60-100	0	225-375	285-475
Mature White Fir	298-398	466-621	262-437	1,026-1,456
Mature Mixed Conifer	1,407-2,346	566-943	3,230-5,384	5,203-8,673
Total	1,765-2,844	1,032-1,564	3,717-6,196	6,514-10,604

MBF = Thousand board feet

Table 4-25. Volume by Logging Systems (MBF), Alternative C. Schoheim Road blocked south of road 41S-2E-3.1

	TRACTOR	CABLE	AERIAL	TOTAL
Poles	210-350	23-39	445-742	678-1,131
Mature White Fir	298-398	466-621	262-350	1,026-1,369
Mature Mixed Conifer	1,764-2939	735-1,224	3,694-6157	6,193-10,320
Total	2,272-3,687	1,224-1,884	4,401-7,249	7,897-12,820

MBF = Thousand board feet

Table 4-26. Projected Harvest Volume Available by Alternative

	A	B	C	D	E
Approximate available Timber volume MBF [1]	21,505	24,273	8,559	0	21,509
Projected harvest interval (years)	120	120	60	0	120
Approximate annual harvest level (MBF)	179.21	202.28	142.65	0	179.21
Approximate Yields by Structure Class					
Poles	20-35%	20-35%	15-25%	0	20-35%
Mature white fir	25%	35%	15-20%	0	25%
Mature mix-conifer	30-60%	40-60%	15-25%	0	30-60%

1. Mid-value within the range projected in table 4-25 MBF = thousand board feet

Table 4-27. Weighted Average Logging Costs/MBF (stump to truck), First entry Timber Value (price paid to Government), and Contribution to Local Economy from Matrix Timber Harvesting*

Alternative	A and E	B	C (gate)	C southern block	D
Logging Cost	$157.60 to $182.23	$157.86 to $181.50	$211.89 to $239.12	$205.17 to $231.57	$0
First Entry Timber Value	$1,000,747 to $2,588,484	$1,337,765 to $2,620,331	$ 64,619 to $393,939	$137,961to $562,413	$0
Contribution to Local Economy	$4,863,531 to $9,888,551	$6,436,285 to $10,017,779	$2,468,676 to $4,307,451	$2,939,737 to $5,110,821	$0

*Values include estimated logging costs, road cost, post harvest slash treatment and normal miscellaneous cost associated with timber harvesting.

Fire

Wildfire Suppression

It is acknowledged that fire will occur within the proposed CSEEA. Over the past thirty years a large percent of lightning caused fires in the proposed CSEEA have been accompanied by rain. Moist fuels and quick response times by Oregon Department of Forestry have been the main reason the fires have not been large in size and burned at high intensities.

Road access plays an important role in determining response time of initial attack forces to a fire. Analysis of fires in the proposed CSEEA over the past thirty years indicates only 9 percent were farther than 600 meters from existing roads. The average response time to these fires was 2 hours compared to an average response time of 1 hour to fires that were within 600 meters of existing roads.

Specific roads within the CSEEA which are critical for initial attack forces have been identified by the Oregon Department of Forestry. Refer to table 4-28 for a list of these roads. Without these roads the probability increases that wildfires would become large and burn at higher intensities. Due to the majority of the CSEEA being in a moderate to high fire hazard there is the concern that without these roads, it would be difficult to keep fires that start on BLM land within the CSEEA from burning adjacent private lands.

The following is an analysis of each of the alternatives on how it would impact wildfire suppression.

Alternative A

There would be no change. All existing roads would be available for fire suppression efforts.

Alternatives B and E

Five of the key roads which are currently natural surface would be improved which could increase response time to fires. This would be a positive impact to suppression efforts. Roads when improved could encourage additional use from the public which could increase human caused fires.

Alternative C

The key roads identified by the Oregon Department of Forestry would be available for suppression. Although not identified as a "key road for fire suppression," the Schoheim road (41-2E-10.1), which has been used by ODF in the past, would not be available for suppression under this alternative. This road is currently marginally effective for fire suppression and becomes worse with the rain that frequently accompanies lightning storms. However, without the Schoheim road, 27 percent of the past fires would have been farther than 600 meters of existing roads. There is a probability that without the Schoheim road, fires in the southern portion of the CSEEA may increase in size in the future.

Alternative D

Under this alternative five of the key roads identified by ODF and the Schoheim road would not be available for suppression efforts. These roads are the BLM roads

Table 4-28. Key Roads needed for Wildfire Suppression Efforts within the CSEEA

Road Name	Road Number/General Location
Power line Roads (Skookum Creek Road)	BLM 40-3E-27.2
Pilot Rock Jeep Road	BLM 40-3E-30.0
Tie Through Road to Emigrant Creek	Private road in T.40S.,R.2E., Section 36
Randcore Pass Road through Private Property to Agate Flat	BLM 40-4E-19.2
Randcore Pass to Rosebud Helipond	BLM 40-3E-19.1
Soda Mountain Road	BLM 39-3E-32.3
Mill Creek to Soda Mountain Road	BLM 40-3E-12.0
Access across Jenny Creek in multiple locations to private property	
Access from California	Copco Road

40-3E-27.2; 40-3E-30.0; 40-4E-19.2; 40-3E-19.1; and the tie road to Emigrant Creek. Without these roads 43 percent of the past fires would have been farther than 600 meters from existing roads. With the closure of these roads under this alternative, approximately 12,000 acres would be more than1,500 meters (1 mile) from a road. Due to the access problem that this alternative would create, other methods may have to be utilized to deliver initial attack forces to fires within some areas within the proposed CSEEA.

One method which is available in southwest Oregon is the use of a rappel ship. Response time to deliver four fire fighters to the CSEEA with a rappel ship is approximately two hours. This type of delivery system has a higher cost and its availability would be limited. Additional roads not available for suppression would result in a higher probability that future fires starts in the CSEEA would become larger in size and burn at higher intensities.

Prescribed Fire

Many factors influence fire behavior and the effects fire will have on a resource. Some factors are beyond our ability to control such as the location of where a fire starts, weather and topography. Prescribed fire is a tool utilized to change the two factors which can be influenced, fuels and vegetation. The primary objective of the use of prescribed fire on lands not it the LSR within the CSEEA is to restore and maintain ecological processes and functioning throughout the CSEEA. The objective of fuels management activities in the LSR is to alter existing fuels in order to protect or minimize damage to existing late-successional habitat. Reference Chapter 4 of the *Jenny Creek Late-Successional Reserve Assessment* for additional information regarding the use of prescribed fire in the LSR.

Alternatives A, B, C and E

Prescribed fire is a tool that would be used under this alternative to meet the ecological objectives of the CSEEA. The use of prescribed fire would also reduce fuels that are currently available to burn in the event of a wildfire. Prescribed fire could also be used strategically on the landscape to reinforce natural features such as major ridge lines to aid in the suppression of wildfires. This would increase the chance that fires which start under more extreme conditions could be effectively and safely suppressed.

Alternative D

Prescribed fire would be allowed on LSR lands to meet the management goals of the LSR. Elsewhere in the CSEEA, the use of prescribed fire would occur in unique cases. This limited use would continue the absence of fire on a large portion of the CSEEA. The probability increases, due to increased fuel loadings, when a fire starts under high to extreme fire conditions, it will burn at higher intensities than historically occurred in the low to moderate fire regimes which exist in the CSEEA.

Transportation Systems

Proposed management activities likely to have the greatest affect on the transportation system within the CSEEA are road closures and road decommissioning. Alternatives A, B, and E would have very low to low adverse impacts to the existing access to lands in the CSEEA. However, both Alternatives C and D would have a high or possibly very high impact to access and use of BLM lands in the CSEEA. Alternatives C and D would limit vehicle access throughout the CSEEA. The general public including recreationists, rock hounds, mushroom collectors, firewood cutting, hunting, casual auto touring would be severely affected by the reduction in open roads. Administrative access for law enforcement, timber sales, small forest products, livestock operators, adjacent landowners, BLM employees, BLM contractors, fire suppression crews, and special forest product sales would also be adversely affected. See the fire and livestock grazing section for specific effects to those uses. Under Alternative C and D access to a large portion of land in the CSEEA would be primarily by foot.

The Aquatic Conservation Strategy and Best Management Practices (RMP, Appendix D) are common to all alternatives.

Table 4-29 shows how the proposed management activities could affect the transportation system. The degree to which these activities affect the transportation varies by alternative.

Livestock Operations and Forage

Background Information

A brief description of the present livestock grazing controls, research findings and studies information is described below to assist the reader in impact analysis. This information in conjunction with past and present livestock use should provide some insight into predicting change by alternative.

There is a substantial body of law and regulation which governs livestock grazing on public lands. Livestock grazing regulations were most recently revised in 1995, leading to the 1997 adoption of *Standards and Guidelines for Rangeland Health*. The new regulations and *Standards and Guidelines for Rangeland Health* for grazing management give management priority to maintaining functioning ecosystems. Although they are just beginning to be implemented, it is anticipated that beneficial effects would occur over time (see Standards and Guidelines, Appendix I).

The objectives of the rangeland health regulations referred to above are: "to promote healthy sustainable rangeland ecosystems; to accelerate restoration and improvement of public rangelands to properly functioning conditions; ... and to provide for the sustainability of the western livestock industry and communities that are dependent upon productive, healthy public rangelands."

Table 4-29. Potential Changes to the Transportation System

ACCESS	A	B	C	D	E
Legal access for the general public	VL	L	H	H	VL
Legal access for land management by BLM, Contractors, and Livestock Operators	VL	L	H	H	VL
Legal access to private property	VL	L	H	H	VL
Fire Suppression	VL	L	H	H	VL

VL = very low potential for effects
L = low potential for effects
M = moderate potential for effects
H = high potential for effects

The Fundamentals of Rangeland Health stated in 43 CFR 4180 are:

1. Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and the timing and duration of flow.
2. Healthy, productive, and diverse plant and animal communities appropriate to soil, climate, and landform are supported by ecological processes including the hydrologic cycle, nutrient cycle, and energy flow. Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow are maintained, or there is significant progress towards their attainment, in order to support healthy biotic populations and communities.
3. Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established Bureau of Land Management objectives such as meeting wildlife needs.
4. Habitats support healthy, productive, and diverse populations and communities of native plants and animals (including special status species and species of local importance) appropriate to soil, climate, and landform. Habitats are, or are making significant progress towards being restored or maintained for Federal threatened or endangered species, Federal Proposed, Category 1 and 2 Federal candidate species and other special status species.

The fundamentals of rangeland health combine the basic precepts of physical function and biological health with elements of law related to water quality, and plant and animal populations and communities. They provide direction in the development and implementation of the standards for rangeland health. These rangeland health standards have been implemented Bureau wide and analysis is currently underway for the area encompassed by the proposed CSSEA study area.

Rangeland trend is noted as static or upward on all of the upland locations throughout the CSEEA (see Rangeland Trend, Appendix J). This is encouraging given the extremely diverse communities and values described in Chapter 2 (Existing Environment). It has been noted that it may require decades to detect significant changes in dry upland communities. Mesic sites and riparian systems are reported to have retained their species continuity and have been shown to respond quickly to improved management. This rapid recovery in secondary succession of the riparian systems has been documented through observation and photo points. [see Chapter 2, also Appendix J (riparian trend photos) and Appendix Q (Menke Report)]

Elimination or reduction in livestock grazing should be carefully weighed against the historical uses under which the present vegetation conditions developed. The withdrawal of prescribed fire and grazing would gradually shift succession toward late seral stages. The edge affects and spatial relationships of plant communities may shift toward continuous forest canopies and brush fields on some sites. This could result in reduced biodiversity as exhibited by butterfly species and other insects, birds, mammals and plants. With total removal of livestock grazing the herbaceous component would become decadent with reduced forage value for deer and elk. Litter buildup in un-grazed native perennial bunch grasses would lead to lowered vigor, dead centers, reduced water use, and higher rates of individual plant mortality. Bunch grass communities could become more susceptible to noxious weed invasion in the longer term. Upland areas as a landscape could become more susceptible to fire ignition. (See discussion under Rangeland Trend, Appendix J)

As explained in the affected environment chapter, significant changes in grazing management have taken place since the 1970s. Present use on the CSEEA study area is 46 percent of the historical cattle numbers from the 1970s. This represents a reduction of 4,605 AUMs and approximately 1,000 cow/calf pairs.

Livestock Grazing

Present laws and regulations, designed to improve public rangelands, already regulate the use of livestock grazing in the study area. These regulations require the application of Rangeland Health Standards to all alternatives in which livestock grazing exist.

Alternatives A and E would tend to maintain existing livestock numbers. Alternative B, the commodity production alternative, would most likely be similar to A and E because of current laws and regulation requiring appropriate rangeland management. Alternative C would tend to reduce livestock grazing to promote ecological process. Alternative D eliminates grazing except under exceptional circumstances where it can be conclusively shown that livestock grazing would be clearly beneficial to the biological and ecological values for which the CSEEA was established.

The effects of livestock grazing on other resource values would be addressed through adaptive management regardless of which alternative is selected. If impacts were found, the resource values would be assessed and adaptive measures could be implemented. New grazing management plans would be written to incorporate new management direction into the grazing program on allotments withing the study area. The Jenny Creek Allotment plan completed in 1997, is current as written.

Access

Motorized travel to manage livestock operations would be more restrictive under Alternative A as land use planning restrictions for ACECs and RNAs are implemented. Travel would be limited to designated roads on Matrix and LSR lands. Alternative C would make livestock operation access more difficult by restricting all travel to a limited number of designated roads. More access would be available using all existing roads under Alternative E and on all existing roads in matrix and LSR lands under Alternative B. Access would be restricted in RNAs and ACEC's under Alternative B while ACEC's would be open using existing roads under Alternative E and RNAs would be closed. Access would be very limited under Alternative D.

Recreation

Visitor travel and recreation is presently closely associated to vehicular access. It is anticipated that reduced access would result in a corresponding reduction in damage and vandalism to range improvements. Presently, vandalism is fairly minor and consists of occasional damage to fences, gates and bullet holes in water troughs. Gates are left open, often by hunters or other recreationists who do not recognize their purpose in controlling livestock utilization, timing, and area of use. More problems would be expected with increased access under Alternative B and E. Alternatives A and C limit access to a greater degree. Permittee livestock operations may not exist under Alternative D.

Rangeland Improvements

Presently the Bureau has a number of rangeland improvements within the study area. Livestock operators are assigned maintenance of these improvements through cooperative agreements based upon their share of livestock use within the allotment.

Alternative A, B and E would continue current maintenance assignments for existing improvements. Selection of Alternative C may substantially reduce the amount of livestock use while Alternative D may eliminate livestock from the CSEEA. Additional constraints or loss of operators would place an additional burden of maintenance costs on remaining operations. Where livestock grazing is eliminated the federal government would assume maintenance responsibility, where appropriate, on some existing improvements.

Construction of new improvements necessary to enhance and protect resource objectives would be appropriate to all alternatives except Alternative D. Alternative D would consist of more natural processes and livestock grazing would not occur. In other alternatives retaining grazing improvements would also enhance other resource values. For example, spring developments would provide off-stream water sources and reduce utilization within riparian zones. Spring sources would be fenced to protect aquatic mollusks and prevent trampling by deer, elk, and livestock.

Areas of Critical Environmental Concern

The present managed grazing use would continue under Alternative A, B and E for the Pilot Rock and Jenny Creek ACECs. Alternative C would allow grazing only when necessary to achieve ecological objectives. Alternative D proposes to cancel grazing with use only under exceptional circumstances where it can be conclusively shown that livestock grazing would be clearly beneficial to the biological and ecological values for which the CSEEA was established.

Substantial change in livestock grazing practices and cattle numbers have occurred over the past two decades. Rangeland monitoring indicates static to upward trends on uplands and therefore no adverse impacts from grazing are expected in the Pilot Rock ACEC. Changes in grazing management practices, lease stipulations and twelve years of Jenny Creek Riparian Volunteer projects have resulted in rapid secondary successional improvement within the Jenny Creek ACEC and riparian system. (See Jenny Creek riparian photos in Appendix J). This positive trend could continue without further grazing restriction.

Research Natural Area

Managed livestock grazing would continue under Alternative A, B, and E. Grazing would be eliminated under Alternative D except under exceptional circumstances where it can be conclusively shown that livestock grazing would be clearly beneficial to the biological and ecological values for which the CSEEA was established. Grazing would be permitted for research purposes and/or managed to achieve ecological objectives under Alternative C.

The Oregon Gulch and Scotch Creek Research Natural Areas have been established for scientific research and as baseline study areas for vegetation cells within the Oregon Natural Heritage Program. These cells have been recognized as outstanding representatives of natural vegetation communities while evolving through more than a century of livestock grazing. Withdrawal of livestock herbivory could result in reduced vigor of perennial bunch grasses and shrubs, making the sites more susceptible to weed invasion and fire. Biodiversity may also be reduced.

Cumulative Impacts

One of the most important values identified by the public was quality of life (Chapter 2, Social and Economics). Open space is identified as one of the most important parameters contributing to quality of life. Ranching operations with grazing leases effected by this plan are estimated to control between 18,000 to 20,000 acres of foothills ranges adjacent to the study area. Large ranch base operations could be lost. Management of public forests and rangelands is currently undergoing dramatic change. Presently, implementation of these changes is brought about by additional regulations. Rapid changes in imposed regulations coupled with poor economic returns on substantial investment capital is causing many ranch operations to fail.

Alternative A, the current situation, would implement existing regulation and continue the slow decline in viable ranching operations. Alternative B would favor livestock operations, but they must still meet the requirements of Rangeland Health Standards. Open space would be retained. The extensive planning and regulation related to Alternative C would cause the loss of additional operations in the short-term. Adjacent landscape holdings may be liquidated for profit and subdivision would replace open spaces. Alternative D might eventually cause the elimination of permittee livestock operations and foothills ownership. Alternative E would have effects similar to Alternative A with more conflict between recreational activities and livestock operations. Improvements may be damaged and gates left open making it difficult to control cattle movement.

Subtle change across the landscape would occur through long-term implementation of the various proposed alternatives. Under Alternative A, the combination of fire and prescribed grazing would retain a mid-successional character to the landscape retaining great biodiversity. Implementation of Rangeland Health Standards would retain the vigor of bunch grasses and shrubs. Forage for deer and elk would be plentiful. Weed encroachment could be slowed by providing healthy native vegetation communities.

Alternative B would attempt to maximize livestock grazing while still implementing Rangeland Health Standards. Experience has shown that attempts to maximize production greatly increases risk and therefore chances of failure when dealing with the multitude of variables involved in managing ecosystems. Weather changes or a lack of available labor would likely cause shifts toward early successional communities. This could place the system in jeopardy and some species at risk. Winter forage for elk and deer could be less available.

Alternative C would be similar to Alternative A except that grazing would be reduced and replaced by fire as a more acceptable tool to maintain a mid-successional character to the landscape. Fire control and fear of escaped catastrophic fire might move the landscape to a more closed forest canopy and dense brush fields. Increased fire frequency of more than once in three years may reduce vigor of bunch grasses and browse through continual loss of nitrogen to the atmosphere. Litter build-up, and lowered or slower nutrient cycling, due to long fire return intervals, would make bunchgrass communities more susceptible to weed invasion.

Alternative D would eliminate grazing except under exceptional circumstances where it can be conclusively shown that livestock grazing would be clearly beneficial to the biological and ecological values for which the CSEEA was established. Alternative D would depend upon natural processes for maintenance of biological and ecological values. Biodiversity would be very high initially and might slowly change as open spaces close and edge effects are reduced. Forage for elk and deer may slowly become in short supply. These processes could evolve for many years or be interrupted in the short-term. Predicting a major fire event would be similar to predicting a major hydrologic event. Fire, when it occurs, could be catastrophic. Weed species might replace many perennials in a mosaic created by fire depending on the circumstances. Following a catastrophic burn, species diversity would be limited and slowly evolve through fire successional processes.

Alternative E would have effects similar to Alternative A. Increased vehicular traffic would cause soil disturbance and weed encroachment along access roads and disturbed areas.

Tables 4-30 and 4-31 summarize the impacts to livestock operations and forage production.

Recreational Use

Off-Highway Vehicles

The current level of cross-country vehicle use in the CSEEA is low, due to the relative isolation of the area from population centers, limited winter access and the terrain and vegetation. The only legal public access route is from Pilot Rock and across the Schoheim Road to Agate Flat. All existing roads and the Agate Flat area receive moderate use during big game hunting seasons and the majority of cross-country vehicle travel occurs in Agate Flat during this time.

Under all alternatives the existing off-highway vehicle (OHV) closures within the congressionally-designated Pacific Crest National Scenic Trail (PCNST) and the limiting of vehicles to the designated way in the Soda Mountain Wilderness Study Area (WSA) will continue in order to protect their outstandingly remarkable recreational resource values and to meet legislative mandates.

For all recreation activities, Alternative A is the existing situation as designated by the RMP.

Under Alternatives A, B, and D, the Pilot Rock ACEC including the Mariposa unit would be closed to OHV use. OHV use in these ACECs would be limited to designated roads under Alternative C and limited to existing roads under Alternative E. OHV use within the Jenny Creek ACEC would be limited to existing roads under Alternatives A, B, and E, limited to designated roads under Alternative C and not allowed under Alternative D. This will have a negative effect on OHV use in those areas.

OHV use would not be allowed in any of the RNAs within the CSEEA under Alternatives A, B, D, and E. Under Alternative C the Scotch Creek RNA would be closed and OHV use within the Oregon Gulch RNA would be limited to designated roads.

On Matrix land OHVs would be limited to designated roads under Alternatives A and C and under Alternatives B and E these lands would be open to OHV use. Matrix lands would not exist under Alternative D.

Within LSR lands, OHVs would be limited to designated roads under both Alternatives A and C, while under Alternatives B and E these lands would be open. The LSR lands would be closed to OHVs under Alternative D.

Under all alternatives except D, OHV use on the Box-O Ranch would be limited to administrative use only, with a seasonal restriction closing the Ranch to all OHV use from November 15 through April 1. The Box-O Ranch designation would not exist under Alternative D as the land would be managed as LSR, ACEC or RNA.

Alternative E would provide the most opportunities and have a positive effect for OHV use, while Alternative D would provide the least opportunities and have the greatest negative effect by eliminating all OHV use of the CSEEA. Alternative A is the existing situation. Alternative C would have negative effects on OHV use by eliminating all

Table 4-30. Impacts on Livestock Operations and Forage

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
•Motorized travel and access would be reduced for livestock operations, matrix and LSR lands would be restricted to designated roads. RMP designations would limit access to ACEC's and RNA's.	•Access would be open and improved on all existing roads in Matrix and LSR lands. ACEC's and RNA access restricted.	•Similar to Alternative A, access would be limited to designated roads in matrix and LSR lands. ACECs would have designated road access. Oregon Gulch RNA designated access.	•Access by vehicles would be severely limited across the area.	•Access would be expanded. Existing routes open as in Alternative B. ACEC access open on existing roads. RNA's closed.
•Visitor use causes some problems with gates left open, range improvements occasionally damaged by bullet holes.	•Increased motorized access could increase the chance of damage to range improvements or harassment of livestock, gates left open.	•Reduced access would reduce chances of damage to range improvements and gates left open.	•Unlikely that livestock would graze area.	•Greater access to general public could increase the chance of damage to range improvements or harassment of livestock.
• Construction of new water developments could protect resources and facilitate achieving resource objectives for grazing.	•Construct new water development and fencing to facilitate grazing and increase production.	•Construction of new water developments to protect resources or to enhance management of livestock, wildlife, recreation or watershed resources could also facilitate achieving resource condition objectives.	•Range improvements unnecessary if grazing is eliminated	•Construction of new water developments could protect resources and facilitate achieving resource objectives for grazing.
•Current livestock numbers would be maintained, additional facilities and management effort could be required due to RNA and ACEC plans. New rangeland health standards and guidelines would be implemented. Grazing management plans would be written to facilitate current management.	•Livestock numbers would be increased to take full advantage of acreage across the area. Grazing would be managed but the emphasis would be toward production with other resource values compromised to some degree. Grazing plans would be written. Rangeland Health Standards apply.	•Current livestock numbers may be maintained, but under much tighter management guidelines. New grazing management plans would be implemented with strict terms and conditions. RNA's would be grazed only as a tool for research purposes. Livestock numbers would be reduced or eliminated if standards are not met.	•Livestock would be utilized only in exceptional circumstances to promote ecosystem health.	•Current livestock numbers would be maintained with additional facilities and management effort required due to RNA and ACEC plans. New rangeland health standards and guidelines would be implemented. Grazing management plans would be written to facilitate current management.
•Increased operational costs associated with additional livestock handling requirements.	•Operational costs per animal would probably decrease creating improved profit margin.	•Operational costs associated with restrictions and added livestock handling requirements would be greatly increased.	•Livestock eliminated there would be no grazing except under exceptional circumstances. •Who would maintain improvements?	•Increased operational costs associated with additional livestock handling requirements. Greater potential for livestock harassment from recreationists.

Table 4-31. Cumulative Impacts to Livestock Operations and Forage

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
•Implementation of existing planning and regulations could make ranching more difficult.	•Ranching would remain viable.	•Extensive planning and regulations may make livestock operation infeasible in short-term.	•Livestock Operations Canceled	•Implementation of existing planning and regulations could make ranching more difficult.
•Some foothill ranch lands may be sold for development through accretion.	•Landscape would retain open space, foothills ranges would be retained to provide seasonal forage before cattle are moved to summer on CSEEA lands.	•Extensive holdings in foothills may be liquidated for profit. The character of landscapes could be altered over time.	•Elimination of livestock operations may necessitate liquidation of several thousand acres in foothills ranges.	•Some foothills ranch lands may be sold for development through accretion.
•A combination of fire and prescribed grazing would retain mid-successional character of landscape.	•Use of fire and expanded grazing would retain early-successional characteristics to the landscape.	•Extensive prescribed fire and reduced grazing would be utilized to retain a mid-successional character to the landscape.	•Fire when it occurs may be catastrophic initially, followed by increased frequency.	•A combination of fire and grazing would retain the mid-successional character of the landscape.
•Rangeland Health Standards would prevent soil disturbance and weed encroachment.	•Rangeland Health Standards would prevent soil disturbance. Extensive grazing could cause some soil disturbance and facilitate weed encroachment.	•Rangeland Health Standards would prevent soil disturbance.	• Soils would be protected by residual weedy vegetation rather than perennial species on drier locations.	•Rangeland Health Standards would prevent livestock damage to soils, however vehicular disturbance would occur and facilitate weed encroachment.
•Riparian areas would stabilize with overhanging woody vegetation. Bio-diversity would be exhibited by a great variety of plants, animals, birds, and insects.	•Riparian areas would recover more slowly, bio-diversity would be reduced.	•Riparian areas would be stable with overhanging woody vegetation. Bio-diversity would be exhibited by a variety of plants, animals, and insects.	•Riparian areas would be stable with overhanging vegetation. Bio-diversity would be high initially and slowly be reduced as open spaces close on forested sites, and south slopes are converted to brush fields and burned.	•Riparian areas would stabilize with overhanging woody vegetation. Bio-diversity would be exhibited by a variety of plants, animals and insects.

Table 4-31. Cumulative Impacts to Livestock Operations and Forage

Alternative A	Alternative B	Alternative C	Alternative D	Alternative E
•Threatened species would be protected. Winter forage for deer and elk would be plentiful.	•Threatened species could be at risk. Winter forage for elk and deer may be less available.	•Threatened species would be protected. Winter forage for deer and elk would be plentiful. Grazing could probably be necessary and animals contracted to complete vegetation management goals.	•Threatened species would be protected.	•Threatened species would be protected. Winter forage for deer and elk may be compromised by weed invasion and vehicular disturbance on some wintering grounds.

legal vehicle access to the Agate Flat area by closing the Schoheim road. The other access roads, although used presently by the public, are done so only by the grace of private owners, the BLM cannot show these roads as access roads if the public does not have legal rights to use them.

Snowmobile use

In the Pilot Rock ACEC including the Mariposa unit, snowmobile use would not be allowed under Alternatives A, B, and D. It would be limited to designated roads under Alternative C, and limited to existing roads under Alternative E until the snow depth exceeded 12" at which time the areas would be open. Snowmobile use within the Jenny Creek ACEC would be limited to existing roads under Alternatives A, B, and E until the snow depth exceeded 12", at which time the area would be open. Under Alternative C, snowmobile use in the area would be limited to designated roads, and under Alternative D, the area would be closed to all snowmobile use.

Within Matrix lands, under Alternative A, snowmobile use is limited to designated roads in big game areas that are not seasonally closed. Outside big game areas, snowmobile use is limited to designated roads until the snow depth exceeds 12" at which time the area is open. Under Alternatives B and E the matrix lands are open to snowmobile use and under Alternative C snowmobiles are limited to designated roads. Matrix lands would not exist under Alternative D.

Under alternatives A and C snowmobile use within the LSR would be limited to designated roads until the snow depth exceeded 12" at which time the area would be open. Under Alternatives B and E the LSR would be open to snowmobiles, and under Alternative D the LSR would be closed to snowmobiles.

Under all alternatives, snowmobile use on the Box-O Ranch would not be allowed due to the seasonal closure, and the Pacific Crest National Scenic Trail is closed to all motorized use.

The impacts to snowmobile use by alternative are similar to OHV impacts with Alternative E being the most favorable and Alternative D the least by closing the entire CSEEA. Regardless of the alternative, snowmobile use within the CSEEA is limited in most years by lack of sufficient snow.

Non-Motorized Recreation

Non-motorized recreation includes, but is not limited to, hiking, camping, backpacking, picnicking, mountain biking, fishing, rock climbing, hunting, and horseback riding. The issue of horse and pack-stock use will be analyzed separately.

Under all Alternatives, non-motorized recreation activities would be allowed in ACECs as long as they do not conflict with the objectives for which the areas were designated.

Under Alternatives A and E, non-motorized recreation activities would be allowed in RNAs as long as they do not conflict with the objectives for which the areas were designated. Under Alternative B only hiking would be allowed in RNAs and only if it did not conflict with the objectives for which the areas were designated. Under Alternatives C and D, non-motorized recreation within RNAs would only be allowed on existing trails.

In Matrix lands, non-motorized recreation activities would be allowed under Alternatives A, B, and C. There would be no Matrix lands under Alternative D, and under Alternative E non-motorized recreation activities would be allowed and enhanced as described under the Recreation Developments section of this chapter.

Non-motorized recreation would be allowed under Alternatives A, B, C, and D in the LSR. Under Alternative E they would be allowed and enhanced as described under the Recreation Developments section of this chapter.

On the Box-O Ranch, non-motorized recreation would be allowed under Alternatives A, B, and C. The Box-O Ranch would not be a designation under Alternative D, and under Alternative E non-motorized recreation would be allowed and enhanced as described under the Recreation Developments section of this chapter.

Non-motorized recreation, with the exception of mountain bikes which are prohibited, would be allowed on the PCNST under all Alternatives. Under Alternative E it would also be enhanced as described under the Recreation Developments section of this chapter.

Non-motorized forms of recreation would not be impacted to any large degree by any Alternative. Alternative E would be the least restrictive and would provide new developments. The other Alternatives vary only in the allowed uses within RNAs and have no new developments proposed.

Horse and Pack Stock Use

Under Alternatives A and E, horse and pack stock use would be allowed in ACECs as long as it did not conflict with the objectives for which the areas were designated. Under Alternative B it would not be allowed and under Alternative C it would be allowed but not promoted. Alternative D would allow horse and pack stock use only on existing roads within ACECs.

Within the RNAs, horse and pack stock use would be allowed under Alternatives A and E as long as it did not conflict with the objectives for which the areas were designated. It would not be allowed in RNAs under Alternatives B, C, and D.

Horse and pack stock use would be allowed in matrix lands under Alternatives A, B, C, and E. Matrix lands would not exist under Alternative D.

In LSR lands, horse and pack stock use would be allowed under alternatives A, C, and

E. Under Alternative B it would be allowed as long as it did not interfere with the attainment of LSR objectives and under Alternative D it would only be allowed on existing roads.

On the Box-O Ranch horse and pack stock use would be allowed under Alternatives A and E and under Alternative C it would be allowed but not promoted. Under Alternative B it would be allowed but only for personal use. The Box-O Ranch would not be a designation under Alternative D.

Horse and pack stock use is allowed on the PCNST under all Alternatives.

There is very little impact to horse and pack stock use under any of the Alternatives. Alternative D is the most restrictive with these uses; allowed only on existing roads, and under this Alternative there would not be many roads in existence. Alternative B is the next most restrictive, and Alternative A is the least restrictive since it is the only Alternative which would allow these uses in RNAs, if not conflicting with the objectives for which they were designated while all the other Alternatives would not allow these uses in RNAs.

Recreation Developments

There are no planned recreational developments under Alternatives A, B, C, or D.

All developments, as described below, would occur under Alternative E.

Within the Pilot Rock ACEC, the trail to the base of the rock would be improved and signed, a picnic area would be developed at the PCNST parking area, and an interpretive display would be designed and built near Pilot Rock to explain the trail environment and associated resource values. Within the Mariposa Lily Preserve ACEC improvements to the Oregon/California trail would be made to facilitate hiking and interpretive signs would be installed along the trail. Within the Jenny Creek ACEC, a campground and improved stream crossing would be constructed at the lower crossing (also called " the Licks").

No developments are planned within the RNAs under any alternative.

Within the Matrix, a hiking trail would be constructed down Lone Pine Ridge to Cathedral Hills overlook and interpretive signs installed. Another hiking trail down Porcupine Gap to Scotch Creek Falls would be constructed. Picnic areas including interpretive displays would be developed near Boccard Point and the summit of Soda Mountain.

Planned developments within the LSR would include building camping facilities at the Soda Mountain corrals and improving the corrals.

A shelter and picnic area would be developed near the headquarters of the Box-O Ranch and a kiosk installed to disseminate current and historical information about the ranch.

In conjunction with the PCNST, the historic Bean Cabin would be rebuilt on-site and primitive horse corrals with a capacity of up to 8 horses would be built nearby.

A variety of recreational opportunities would be available to a degree under all the Alternatives. Allowed uses of the Soda Mountain WSA and the PCNST would be the same under all Alternatives. Access to the widest range of experiences would be available under Alternative E since most OHV opportunities would be allowed, primitive experiences would still exist and recreational developments would occur.

With the Schoheim Road closed under Alternatives C and D, the public would have no legal vehicle access to the Agate Flat area. This would eliminate almost all use of the area although the public gains access by other means than the Schoheim road. Alternative D would be the most restrictive to mechanized and motorized forms of recreation, but would provide visitors with the most opportunities for primitive experiences. Alternative A would be a continuation of the existing situation. See Table 4-32 for a comparison of effects as a result of the alternatives.

Land Use Allocations

Background

The realty program operating under the jurisdiction of the Medford District Office of the BLM is oriented towards public service. Authorizations are generated by applications from the private, commercial, and government sectors. The BLM does not actively solicit or advertise the availability of land use authorizations, but when applications are received for legitimate uses as chartered under FLPMA, there is an obligation to accept, process, consider, and ultimately decide on these requests. Table 4-33 provides relative information for the various alternatives being addressed under the EIS, and represents the best projection of impacts to the program based on past actions and projected future consequences.

Social and Economics

This section discusses the effects of the alternatives on the social and economic environment. Specifically, six areas of effects are of interest, each to be addressed in turn:

- The Greensprings community
- Jackson County as a whole
- Soda Mountain Wilderness Council
- Agricultural interests
- Forest and wood products
- Recreation

Following this discussion, table 4-41 summarizes the major effects for each alternative.

The Greensprings Community

The Greensprings community has a long history of relationship with the BLM. Through the leadership of Friends of the Greensprings (FOG) and grazing interests, BLM has been engaged with the community for many years. People did not feel positively about this experience. Although a couple residents mentioned the watershed assessment efforts as a positive collaboration, and several people mentioned BLM individuals with whom they had good working relationships, overall residents have stated that the effort has not yielded for them what they wanted. The interests that emerged from discussions with community residents are the following:

Collaboration and consultation: Residents believe they are good observers of the land and can offer insights regarding public land management. They reported being not consulted with on a regular basis and even disregarded. A number of people described the years they have spent involved in natural resource issues, only to have their perspective bypassed when it came time for action. This experience led to feelings of suspicion and hostility toward our mission of soliciting their input for this EIS.

Table 4-32. Comparison of Effects to Recreational Uses					
Area	**Alt. A**	**Alt. B**	**Alt. C**	**Alt. D**	**Alt. E**
OHVs					
Pilot Rock ACEC including Mariposa Unit	Moderately Negative	Moderately Negative	Minimal	Moderately Negative	Minimal
Jenny Creek ACEC	Moderately Negative	Moderately Negative	Moderately Negative	Very Negative	Moderately Negative
Scotch Creek RNA	Very Negative	Very Negative	Very Negative	Very Negative	Very Negative
Oregon Gulch RNA	Very Negative	Very Negative	Moderately Negative	Very Negative	Very Negative
Matrix Lands	Moderately Negative	Positive	Moderately Negative	N/A	Positive
LSR Lands	Moderately Negative	Positive	Moderately Negative	Very Negative	Positive
Box-O Ranch	Very Negative	Very Negative	Very Negative	N/A	Very Negative
PCNST	Very Negative	Very Negative	Very Negative	Very Negative	Very Negative
Snowmobiles					
Pilot Rock ACEC Mariposa Lily Preserve ACEC	Very Negative	Very Negative	Moderately Negative	Very Negative	Positive
Jenny Creek ACEC	Positive	Positive	Moderately Negative	Very Negative	Positive
Scotch Creek RNA	Very Negative	Very Negative	Very Negative	Very Negative	Very Negative
Oregon Gulch RNA	Very Negative	Very Negative	Moderately Negative	Very Negative	Very Negative
Box-O Ranch	Very Negative	Very Negative	Very Negative	N/A	Very Negative
Matrix Lands	Minimal	Positive	Moderately Negative	N/A	Positive
LSR Lands	Minimal	Positive	Minimal	Very Negative	Positive
PCNST	Very Negative	Very Negative	Very Negative	Very Negative	Very Negative
Non-Motorized Recreation					

Table 4-32. Comparison of Effects to Recreational Uses

Area	Alt. A	Alt. B	Alt. C	Alt. D	Alt. E
Pilot Rock ACEC Mariposa Lily Preserve ACEC Jenny Creek ACEC	Minimal	Minimal	Minimal	Minimal	Minimal
Scotch Creek RNA Oregon Gulch RNA	Minimal	Minimal	Minimal	Minimal	Minimal
Matrix Lands	Positive	Positive	Positive	N/A	Very Positive
LSR Lands	Positive	Positive	Positive	Positive	Very Positive
Box-O Ranch	Positive	Positive	Positive	N/A	Very Positive
PCNST	Minimal	Minimal	Minimal	Minimal	Minimal
Horse and Pack Stock Use					
Pilot Rock ACEC Mariposa Lily Preserve ACEC Jenny Creek ACEC	Minimal	Very Negative	Moderately Negative	Moderately Negative	Minimal
Scotch Creek RNA Oregon Gulch RNA	Minimal	Very Negative	Very Negative	Very Negative	Very Negative
Matrix Lands	Positive	Positive	Positive	N/A	Positive
LSR Lands	Positive	Minimal	Positive	Moderately Negative	Positive
Box-O Ranch	Positive	Minimal	Minimal	N/A	Positive
PCNST	Positive	Positive	Positive	Positive	Positive
Recreation Developments					
Pilot Rock ACEC Mariposa Lily Preserve ACEC Jenny Creek ACEC	Very Negative	Very Negative	Very Negative	Very Negative	Very Positive
Scotch Creek RNA Oregon Gulch RNA	Very Negative	Very Negative	Very Negative	Very Negative	Very Negative
Matrix Lands	Very Negative	Very Negative	Very Negative	Very Negative	Very Positive
LSR Lands	Very Negative	Very Negative	Very Negative	Very Negative	Very Positive
Box-O Ranch	Very Negative	Very Negative	Very Negative	Very Negative	Very Positive
PCNST	Very Negative	Very Negative	Very Negative	Very Negative	Very Positive

Table 4-33. Land Use Authorization Impacts as a Result of Alternative A (No Action)

Impacts to Environment	Impacts to Private Interests	Impacts to Commercial Interests	Impacts to the Agency (workload)	Impacts to the Agency (financial)
Minor to moderate, based on size & extent of authorization	None or Minimal	None or Minimal	Minimal to moderate	Minimal to moderate
Impacts minimized by mitigation using BMP's*	Applications processed & generally approved with environmental mitigation	Applications processed & generally approved with environmental mitigation	Workload consistent with past 5 to 10 years of program management	Workload consistent with past 5 to 10 years of program management
	Existing authorizations renewed upon request and review	Existing authorizations renewed upon request and review		

* Best Management Practices

Table 4-34. Land Use Authorization Impact as a Result of Alternative B

Impacts to Environment	Impacts to Private Interests	Impacts to Commercial Interests	Impacts to the Agency (workload)	Impacts to the Agency (financial)
Minor to moderate, based on size & extent of authorization	None or Minimal	None or Minimal	Minimal to moderate	Minimal to moderate
Impacts minimized by mitigation using BMP's*	Applications processed & generally approved with environmental mitigation	Applications processed & generally approved with environmental mitigation	Workload consistent with past 5 to 10 years of program management	Workload consistent with past 5 to 10 years of program management
None	Existing authorizations renewed upon request and review	Existing authorizations renewed upon request and review	Minimal	Minimal

* Best Management Practices

Table 4-35. Land Use Authorization Impacts as a Result of Alternative C

Impacts to Environment	Private Interests	Commercial Interests	the Agency (workload)	the Agency (financial)
None	Maximum due to loss of opportunity for land use authorizations	Maximum due to loss of opportunity for land use authorizations	Maximum due to private land acquisition policy	Maximum due to purchase or exchange of private lands
None	Maximum due to no new applications accepted due to land use planning redirection*	Maximum due to no new applications accepted due to land use planning redirection*	Minimal	Minimal
None	Maximum if not renewing existing authorizations	Maximum if not renewing existing authorizations	Minimal	Minimal

* BLM would still accept & process applications for access to landlocked private parcels.

Table 4-36. Land Use Authorization Impacts as a Result of Alternative D

Impacts to Environment	Private Interests	Commercial Interests	Impacts to the Agency (workload)	Impacts to the Agency (financial)
None	Maximum due to loss of opportunity for land use authorizations	Maximum due to loss of opportunity for land use authorizations	Maximum due to private land acquisition policy	Maximum due to purchase or exchange of private lands
None	Maximum due to no new applications accepted due to land use planning redirection*	No new applications accepted due to land use planning redirection	Minimal	Minimal
None	Maximum if not renewing existing authorizations	Maximum if not renewing existing authorizations	Minimal	Minimal

Table 4-37. Land Use Authorization Impacts as a Result of Alternative E

Impacts to Environment	Impacts to Private Interests	Impacts to Commercial Interests	Impacts to the Agency (workload)	Impacts to the Agency (financial)
See Recreational permit section, Alternative E	Minimal to moderate	Minimal to moderate	Minimal to moderate	Minimal to moderate

Restoration: Residents believe they are good stewards of the land and want to participate directly in restoration efforts on public lands. Continued human management of the public lands, with the possible exception of lands that may be designated wilderness, is desired by almost all of the residents to whom we talked. Although they are very nervous about the prospects of commercial activity, they do desire restoration efforts generally. Specifically, thinning, fire hazard reduction activities are desired.

Restoration employment: Within the constraints of restoration values (minimal commercial activity, light touch harvests, forest health objectives), residents desire employment opportunities with restoration projects.

Education: To the extent that BLM activities could be conducted in a way to educate newcomers about care of the land, residents expressed interest in working collaboratively with BLM. This interest was voiced most often in relation to interface and fire hazard reduction efforts, especially on public lands contiguous to private lands, the so-called "interface" areas.

Support of Recreation Business Opportunities: Although no one expects a mass tourism situation to develop anytime soon, there is an expectation that modest increases in recreation use will occur over the next several years, and that economic opportunities are associated with the expected increase. Alternatives that fostered recreation activity without environmental degradation would be favored.

Greensprings residents expressed keen desire to discuss alternatives in detail, although they were skeptical that such discussion would do much good. Given that, as a community, residents would be better equipped to do this step themselves, it is nevertheless likely that they would not see high commodity production (Alternative B) as in their interest, nor lack of management altogether (Alternative D). Timber harvest, as called for in Alternatives A, B, and E, could be supported with light touch, low volumes, and restoration elements. Similarly, the recreation alternative (E) would likely be seen as bringing in too many people too quickly for non-motorized uses, and the level of OHV use permitted by Alternative E would be alarming for many. Grazing alternatives (A, B, E) could be supported with environmental controls and resolution of conflicts between permittees and residents.

For all the alternatives, it is the method of implementation that will most affect community interest in collaboration, restoration and education. Timber sales that include restoration components, fire hazard reduction projects that include contiguous neighbors, mutual planning regarding emerging recreation opportunities—these are management prerogatives that will influence these interests.

Soda Mountain Wilderness Council

Although the Soda Mountain Wilderness Council does not represent the views of all environmentalists, it has been a central player in the destiny of the Soda Mountain area and is given focus here in the interest of efficiency. In comments entitled "Defending the Bridge," submitted in conjunction with several other environmental groups as part of scoping for this EIS, these interests were most clearly stated:

- Minimize or eliminate human influence to allow natural functioning to restore the ecosystem, especially grazing, OHV use, and roads.
- Allow, but don't encourage, recreation use.

Alternative D, and to a lesser extent, C, are likely to be most favorable to environmental interests summarized above. Alternative B would be least desirable, while Alternative E promotes recreation rather than just tolerates it.

Jackson County

The Board that represents the Jackson County Commissioner on grazing and timber issues, and serves as liaison to the Natural Resource Advisory Committee of Jackson County has voiced two clear goals in relation to this EIS.

- Management options should be kept open. The condition of the land should dictate the level of timber and grazing production, and "getting the cut" should not be the first priority. At the same time, the land should not be designated in a way that prevents any production whatsoever.

- Economic health in Jackson County is a priority. Management prescriptions that contribute to the economic health of the county will be supported.

Given these priorities, Alternative C and D are likely to be least preferred by the County, while A, B, and E could be supported. However, a discussion with the Board of the current status of the land, based on the scientific information contained in this report, could temper this conclusion.

Agriculture

Ranchers in the CSEEA described a pessimistic outlook for the continued viability of their operations. Interviews with 5 of the permit holders in the Greensprings area, and 12 other cattlemen, academics or agency people with experience in grazing issues, revealed a very similar viewpoint. Virtually all ranchers stated that loss of public grazing at this time would mean the end of their ranching operations. The common perception is that increasingly stringent requirements have been met year after year, while AUMs have been steadily declining. Ranchers do not believe they can financially absorb additional requirements. Moreover, they do not believe that further requirements are necessary. They do not perceive the level of degradation claimed by their regulators and believe that management for late seral stages is bad for wildlife and fraught with uncertainties.

Not only do ranchers say they will be unable to afford additional costs associated with allotment maintenance or reductions in AUMs, the replacement opportunities are not great. Private pastureland is difficult to find, more expensive to lease, and has the additional costs of transportation. While private land AUMs require less investment from ranchers, that savings is more than offset by the price of trucking. One observer stated that trucking costs about $2.25/mile for a semi-truck trailer that can carry 50,000 pounds (about 40 cows and calves).

Table 4-38, below, shows a calculation of what current grazing in the CSEEA area might provide to the Jackson County economy. It shows the relationship between AUMs and certain economic indicators in the Klamath Falls Resource Area of BLM using an input/output economic model (BLM,n.d.). Input output models measure the relation of economic activity to other sectors of an economy. If income is spent locally, as when a sector has sufficient infrastructure like supply stores, dollar turnover in the community is high, creating a so-called "multiplier" effect. If income generated locally through exports is spent elsewhere, the multiplier will be low. Such a sector is said to have high leakage.

Given the absence of such economic modeling in Jackson County, the ratios generated by the Klamath Falls data were duplicated for the AUMs in the CSEEA area. Table 4-38 shows that if the Klamath Falls ratios hold for Jackson County, the 4,148 AUMs in the CSEEA area annually generate $460,529 in sales, $56,425 in personal income, and 11.1 jobs. It is doubtful whether a comparison like this is a substitute for an input/output analysis for the CSEEA area. The cattle industry provides a higher economic base in Klamath County than in Jackson County, so the industry support services are more prolific. Hence, the Klamath Falls multiplier is likely to be higher than in Jackson County.

Alternative B is most likely to be favored among cattle people because of its emphasis on commodity production, while it is presumed that Alternatives A and E would not result in lower AUMs. Alternatives C and D would be presumed to eliminate public land grazing because of additional restrictions. It is worth noting that the use of grazing to accomplish resource management objectives, called for in Alternatives C and D, is unlikely to occur. Since reduced AUMs are implied by these alternatives, it is not likely that allotments will still be utilized by current allotment holders.

Forest and Wood Products

Timber operators in Jackson County have expressed interest in maintaining access to public timber supply. They do not support policies that curtail that supply. The timber companies that own industrial timberlands in the CSEEA area have stated similar attitudes. In addition, these companies expressed concern of policies that encourage further recreation and human settlement. They had stories of new residents or recreationists that begin complaining of the noise, smells, and timber practices. The concern is that these conflicts will escalate and negatively affect their activities.

The "Timber Harvest" section of this chapter showed the potential timber supply available for harvest for each of the alternatives. Table 4-27 shows the contribution to the local economy ranging from 0 (Alternative D) to $10 million. All timber cutting alternatives (A, B, C, E) provide $9-10 million to the local economy. This figure represents payroll generated to get logs to the mill, such as road construction, logging, slash treatment and trucking.

Table 4-38. Klamath Falls AUM Multipliers Applied to the CSEEA

	Klamath Falls Resource Area	Jackson County, CSEEA Area
Animal Unit Months (AUMs)	13,869	4,148
Sales (cattle & calves)	$1,539,800	$460,529
Personal income	$322,400	$56,425
Jobs (direct, indirect, & respending)	37	11.1

Table 4-39. Average Number of Workers Per Board Foot in Jackson County, Oregon

Year	Jackson County Timber Harvest, Thousands Board Feet (Scribner)[1]	SIC 24 Workers[2]	Workers per Board Foot
1993	170,375	4804	.000028197
1994	113,399	5040	.000044445
1995	162,466	4909	.000030216
1996	105,373	4785	.000045410
1997	141,489	4529	.000032010
1998	131,184	4352	.000033175

1. Source: Oregon Department of Forestry, Annual Oregon Timber Harvest Report, Salem, Oregon.
2. Standard Industrial Classification 24 is Lumber and Wood Products Manufacturers (except furniture) and includes logging, saw and planing mills, Millwork, Veneer and Plywood facilities, structural wood members, wood containers, wood buildings and mobile home manufacturing.

Table 4-40. Projected Annual Jobs and Payroll Sustained Through Timber Harvesting

Alternatives	A	B	C	D	E
Approximate Annual Harvest in Board-Feet [1]	179,210	202,280	142,650	0	179,210
Jobs Sustained by this Annual Harvest [2]	5.5	6.2	4.4	0	5.5
Projected Wood Products Payroll [3]	171,028	192,795	136,822	0	171,028
Related Jobs Sustained by Harvest Level [4]	7.7	8.7	6.2	0	7.7
Projected Total Net Change in the Number of Jackson County Jobs [5]	0	1.7	-2.6	-13.2	0
Payroll Sustained by Related Jobs [6]	186,987	211,271	150,361	0	186,987
Total Payroll [7]	358,015	404,066	287,383	0	358,015

1 Annual harvest volume from table 4-26.
2. Projected board feet X worker ratio of .00003049.
3. Number of jobs X average salary for SIC 24 workers, $31,096 in 1998.
4. Using a multiplier of 2.4 jobs (1 mill job plus 1.4 induced jobs), Sector 134, obtained from IMPLAN Multiplier Tables for Jackson and Josephine Counties, Minnesota IMPLAN Group, June 8, 1999.
5. Applied X worker ratio of .00003049 applied to change in annual yields from current level..
6. Using the average pay for "all industries" in Jackson County for 1998, $24,284.
7. Sum of wood products and additional payrolls.

Two tables, below, present an analysis of likely economic effects of projected timber harvest for each of the alternatives. Table 4-39 was used to determine an average ratio of workers per board foot of milled lumber over a six year period, which was 0.00003049. Table 4-40 then calculates workers and payroll generated, both from production activity itself, and from the secondary effects of workers' spending in the community. Table footnotes include the assumptions used in the calculations. The total figures in the table represent the "mill to market" figures and should be added to the total economic value of the harvesting operations, itemized in table 4-27. These figures should be viewed as estimates only, and not a substitute for an input/output analysis that would calculate effects directly.

Under Alternative A, B and E the available timbered acres would remain a component of the Medford District's allowable sale quantity (PSQ) calculation. Although the Medford District has deferred harvesting within the CSEEA until the completion of this EIS/plan, the volume contribution that the CSEEA would have made to the District's harvest level during this deferral is being obtained elsewhere on the District. Therefore, the District's current harvest level will remain unaffected by alternative A, B and E. Under Alternative C, the available timbered acres within the CSEEA would be removed from the Medford District's PSQ calculation resulting in the possibility of a slight reduction in the annual PSQ. However, any reduction could be partly offset by harvesting, to facilitate forest health objectives, within the CSEEA that is not attributable to the PSQ calculation. Under Alternative D, no commercial harvesting would occur within the CSEEA which could result in a slight reduction in the District's PSQ. (Table 4-40)

Recreation

Various types of recreationists were contacted during the preparation of this EIS. Each reported different patterns of use and strong interest in maintaining or expanding recreational use of the CSEEA area. Use remains undocumented, however.

Most observers felt that the potential for recreation growth in the future is modest. Even with a recreation oriented national designation, sports enthusiasts did not believe that large increases in recreation use would occur. However, a number of them voiced interest that, in the future, special events could be staged that would attract non-local use. Some people also expressed an expectation that at some point regional capacity would be expanded, such as a series of winter huts for snowmobile enthusiasts, and so on.

It is assumed that the interests of motorized and non-motorized recreationists are not the same. Hikers and backpackers want minimal human influence in their outdoor experiences. They are likely to be members of environmental groups and to advocate for less commodity production on public lands. By all reports, current levels of trail and amenities development is sufficient.
Motorized recreationists, on the other hand, have interest in maintaining or expanding access into primitive areas. They believe use rates are steadily, if not rapidly, increasing and that future demand will be strong. They expressed alarm at the possibility of a national designation that would exclude off highway vehicles. They believe their environmental record is strong and that they are the best hope for controlling renegades that create damage.

No studies have been reviewed that would document sufficient demand to warrant the level of recreation development specified in Alternative E.

Mitigation Opportunities

The National Environmental Policy Act (NEPA) requires federal agencies to identify and consider mitigation measures that would minimize adverse and enhance positive effects of its decisions. The Resource Management Plan (RMP) of the Medford BLM District further supports this intent by calling for measures to support socioeconomic objectives when possible. The RMP goes further to say that BLM "aid and support" could include: increased coordination with citizens and local governments; added efforts to increase the economic return of recreation activities; and, production of a range of forest products for both large and small operators to sustain the wood products industry (1995: 80-81). This section identifies possible mitigation measures designed for this purpose.

Greensprings Community

Develop a community-based approach to BLM projects that incorporate community values, participation and labor.

Sustain and expand fire hazard reduction projects in the interface zone, structuring such projects to educate newcomers about forest management.

Forest workers report high interest in more work derived from public lands management, specifically, restoration, thinning of overstocked stands, and value-added production. An informal network of individuals currently handles much of the wood lot management work for residents. Another set of people have attempted to purchase timber lands in order to protect them from logging. There has been active discussion in creating a small log sort yard that could accumulate "special demand" logs for artisans, small diameter material, hardwoods, and stockpile material to obtain better prices. BLM could support these efforts of the Greensprings community to participate in, and derive benefits from, ecosystem restoration through training, restoration projects, and support of value-added endeavors.

Table 4-41. A Comparison of Social and Economic Effects of Alternatives					
Issues/Concerns	**A**	**B**	**C**	**D**	**E**
Greensprings Community					
Collaboration	Neutral	Neutral	Neutral	Neutral	Neutral
Restoration	Negative	Negative	Positive	Positive	Negative
Restoration Employment	Neutral	Neutral	Neutral	Neutral	Neutral
Education	Neutral	Neutral	Neutral	Neutral	Neutral
Recreation Business Opportunities	Modest	Modest	Modest	Non-motorized only	Positive
Soda Mountain Wilderness Council					
Eliminate/minimize roads, grazing, OHVs	Slightly Positive	Very Negative	Positive	Very Positive	Negative
Allow but don't encourage Recreation	Neutral	Neutral	Neutral	Very Positive	Very Negative
Jackson County					
Management Options Open	Positive	Positive	Negative	Very Negative	Positive
Economic Health	Positive	Positive	Negative	Very Negative	Positive
Agriculture					
Steady or expanding AUMs	Positive	Positive	Negative	Very Negative	Positive
Forestry/Wood Products					
Maintain Log Supply	Positive	Very Positive	Negative	Very Negative	Positive
Recreation (Motorized)					
Expanded Access	Neutral	Neutral	Negative	Very Negative	Very Positive
Recreation (Non-Motorized)					
Current levels meet demand	Neutral	Neutral	Neutral	Loss of Equestrian	Positive

Agriculture

Some examples of successful collaboration between cattle people and environmentalists have been emerging in the West in recent years. One recent article in Atlantic Monthly described several coalitions related to public land grazing that showed promise of resolving environmental concerns while retaining grazing (Knize 1999). Other areas of the West have witnessed the reduction of grazing on public lands.

If the science shows that there are some beneficial effects of grazing, or that range practices are capable of sustaining grazing while meeting environmental objectives, then BLM should re-affirm its commitment to public lands grazing. It could work to develop an "accountability structure" between BLM and permittees whereby grazing privileges are linked to environmental standards, and objective criteria are mutually agree upon.

If the science shows that grazing should be phased out, explore the possibility of buying out the permittees of their "customary privilege." Develop a transition period to minimize the abruptness of any decision.

In conjunction with residents and other responsible agencies, facilitate the resolution of legitimate concerns related to public land grazing in areas of human settlement.

Forestry and Wood Products

The Medford District of the BLM could foster market development for small diameter material thinned from overstocked stands by working with harvesters and producers to ensure a consistent supply.

Recreation

BLM could facilitate community capacity to respond to emerging business opportunities in recreation. Fostering communication, regional strategies, entrepreneurial development, and individual business plans could be a start. Coordination with the Regional Strategies Board could be helpful as well.

Chapter 5 - Consultation and Coordination

Chapter 5 - Consultation and Coordination

Summary of Scoping

The National Environmental Policy Act (NEPA) ensures that environmental information is available to citizens and public officials before decisions are made and before actions are taken. It also provides a regulatory avenue for private citizens and organizations to express their opinions which may influence the proposed action. Scoping meetings are held early in the planning and decision-making process to establish effective and open communication with the public.

Scoping is an open process designed to determine the breadth of issues to be addressed in the EIS. It is intended to obtain the views of the public; state, local, and tribal governments; and other federal agencies. By involving the public through the scoping process, the proponent: develops a comprehensive list of issues, then identifies the significant issues for study, aids in the development of additional alternatives, and ensures that the draft EIS is balanced and thorough.

Scoping also assesses the level of public interest in the project and identifies the agencies, groups, and individuals likely to be most interested in the proposed project. Scoping can have a profound and positive effect on the issues to be examined within the EIS, the environmental analyses, and, ultimately, on the decision made.

The CSEEA scoping period began with a published Notice of Intent in the Federal Register dated August 27, 1999. The Notice of Intent stated that "Written comments will be accepted until October 29, 1999." It was the first notification that public scoping meetings were scheduled. These meetings included four field tours and one meeting. Field tours were held on Tuesday, September 28; Saturday, October 2; Wednesday, October 6; Monday, October 18, 1999. The meeting was held at the science building auditorium of Southern Oregon University, Ashland, Oregon on Saturday, October 9, 1999. Additional notification was by a BLM press release, the purchase of newspaper space in four local papers (Medford, Ashland, Klamath Falls, Oregon and Yreka, California), and the mailing of over 500 scoping brochures. An additional field tour was held in northern California on October 18, 1999.

During the scoping period, 427 letters, cards and e-mails were received and 153 comments from the public meeting were recorded, for a total of 583 responses coded. Letters were received from Ashland, OR (98), Medford, OR (29), Hornbrook, CA (13), Talent, OR (13), Montague, CA (11), and Portland, OR (11). Letters were received from a variety of other places, the furthest being Vermont, Kentucky, Ohio and Georgia. The majority of comments fall into two groups, those supporting the special ecological emphasis designation (218) and those against further restriction of public land uses (128). Some letters support a more middle ground approach (29) and other letters requested more information without voicing an opinion regarding the project (47). Form letters were submitted by many respondents (84).

Fifty four issues ranging from ecological concerns, to land use, to government control emerged after all letters and comments were coded and analyzed. The most significant issues for the two groups generally differed. Those supporting the CSEEA designation emphasized preservation and restoration of ecological values. Those against the designation raised concerns about restrictions on access to public resources and increased federal government control over public and private lands.

The following key issues are listed in order of frequency with examples of some of the comments. These comments represent a summary of those received by Medford District BLM.

Key Issues and Concerns

Grazing

Grazing is an issue of great concern that was in almost every response from groups. Many express concern over the adverse effects of grazing on the ecology of the area (175), and often mentioned the costs of government subsidy of ranchers. Others support retaining grazing practices (74), and feel that the proposed plan threatens their livelihood and way of life. This group views grazing as a management tool for fire prevention and wildlife habitat enhancement.

> "Commercial livestock have long had a deleterious effect on both riparian and upland portions of the area."
>
> "Having taken numerous hikes in the region being studied, I am always continually amazed at how much destruction of the native environment occurs wherever cattle are grazing. There is no shortage of land for cattle to graze on, nor is there a shortage of feed. Cattle grazed on private land can generate a reasonable profit without the subsidy given federally grazed cattle. ... If there is an ecologist or biologist that honestly thinks cattle grazing is good for the natural environment, please have them contact me so I can better understand why the BLM wants to continue cattle grazing in sensitive environmental areas."
>
> "It is one of the few areas in southwestern Oregon where the underbrush is under control due to the grazing of cattle. This not only prevents future forest fires, but it also beautifies the forest making them more open and allowing better access through the area without the need for additional roads or trails."
>
> "As a permit holder for livestock grazing in the Umpqua National Forest I have observed how forests become degraded by non-use! I believe that many species depend on certain activities existing such as grazing and logging. A hands off approach could lead to the demise of some of the very species some want to protect.... I believe that solutions can be implemented that take into account a broader picture, not just the narrow panic opinions of some of the eco-terrorists, environmentalists!"
>
> "We are particularly concerned with the BLM's apparent willingness to accept grazing as a "management tool" in the CSEEA, especially in the Box O area, where cattle may compete with the expanding elk herd which uses the area. There is a plethora of research which shows that grazing is harmful to many species, introduces noxious weeds and degrades riparian areas."

Roads

Many respondents see CSEEA roads as having a detrimental effect on land, water quality, wildlife and human experience (e.g., noise). Erosion issues are often raised. This group recommends decommission of all non-residential roads and jeep trails (151) and restriction of off-road vehicle use (118).

Many other commentors request maintained access for recreation and fire suppression. Access for motorcycles and other off road vehicles is of high concern (40). The Schoheim Road was mentioned often, both for its degradation and importance for access.

> "Roads are perhaps the most serious threat to the ecological integrity of the CSEEA. The problems they cause are both direct and indirect. Direct problems include erosion and alteration of hydrology; fragmentation of wildlife habitat; and spread of noxious weeds and wildlife species. Indirect problems include every way in which roads and jeep trails provide the means for destructive human activities to spread into the CSEEA."

> "Last year some well meaning government official's in their attempt to protect this area closed off the last ten miles of four wheel drive road on each end of the old three mile long trail where we used to fish and camp. Now with the only access by foot, horse or bicycle my father, who just turned 80, my mother and our family can no longer enjoy our favorite spot. This is an area which to the best of my knowledge has not changed in character over the 40+ years we have visited there. The road and river are the same as ever."

> "The Schoheim was built ...as a stable and necessary fire access road to and through the area...is still critical access."

> "...I especially want the Schoheim Road to remain open to motorcycles. The road to the Soda Mountain lookout should be maintained and kept open to vehicles including off road vehicles. The powerline roads should be kept open to off road vehicles. To even consider closing these roads to the public because of a small law enforcement problem is ridiculous."

Timber Harvesting

Most respondents oppose commercial harvesting because of adverse ecological effects (141). Others cite the importance of allowing some level of logging such as selective harvesting (28) to provide jobs and reduce fire hazard. Restriction of this commodity use does not raise as much concern as restrictions on grazing by those opposed to the proposed Plan.

> "Loggers should be allowed to cut selectively and delicately in nearly any forest in our country. I stress the word "delicately." Yes, it will cost the logger and you more time and probably special equipment, and the logger must by compensated for such work. Higher lumber prices? you bet. Such is life....No clear cutting anywhere."

Mining

Mining was another commodity use of concern to those in support of ecological designation for the area, again because of its adverse effects (97). Mining is not often mentioned by those against ecological designation.

Fragmentation

Many respondents see the proposed Plan as a way to address the issue of fragmentation and to enhance connectivity by acquiring private holdings from willing landowners (86). Many respondents think the size of the area needs to include more acres than proposed.

Unique Natural and Biological Values

A number of people cite the importance of retaining this particular area for its unique character. The CSEEA's diversity and fragility were often mentioned, as well as its wildlife, native plants, insects, fish, and water quality. Many respondents are concerned about the spread of noxious weeds and further degradation of fragile meadows. These values are mentioned more often than old growth forests. Many responses in both groups mentioned Jenny Creek and Horseshoe Ranch as important biological sites.

> "The use of our public lands by private extractive industries may make a few people rich in the short term, but protection of irreplaceable treasures like the Soda Mountain area will make generation after generation rich in the long term."

> "When I become old, infirm or handicapped and can no longer make it down to the bottom of Dutch Oven, I want to know there is still a wild, diverse, clear-stream (with fish!) and big trees in a canyon for my children and other adventurers to find a place to be their wild selves in."

Fire

All groups express concerns about fire suppression, including limited road access, and ability to introduce fire and develop adequate fire planning.

> "... an expanded use of prescribed fire could help restore natural processes, reduce the risks of catastrophic loss and meet the overarching ecological objectives of the CSEEA. These positive outcomes would, of course, be contingent on detailed planning, adequate budgetary support, and careful execution."

> "Before my family and I moved here to Hilt, we lived in a area that was declared Wilderness. The community that we lived in had to endure the harassment and petty restrictions that were imposed on us as well as 13 out of 45 homes were lost to a large wildfire that ran through back in 1993. In summation of that unfortunate time the bottom line is it is more than pathetic when people loose their homes because they were not allowed to clear brush around their homes due to the Wilderness act provisions. It took the state Governor to correct that mistake from happening again."

Capacity to Manage as a Protected Area

The ability of the BLM to adequately manage the proposed area is of concern. Law enforcement, scientific studies, restoration and monitoring are among those mentioned as requiring adequate funding.

Big Government

Those opposed to the proposed CSEEA Management Plan express concerns about government control. Of particular issue are combining Oregon and California jurisdictions, regulation and "taking" of private property, local autonomy, loss of personal freedom, lack of respect for way of life and livelihood.

> "The reason this land is so diverse and in good condition is the good stewardship of the people who live here and make a living from the land."

> "As more & more land is termed wilderness— "people stay out", we loose more & more of our privileges— what happened to "the land of the free?"... If there is no control of our beautiful lands. The bugs and forest fires will soon destroy it— then what?"

Hiking and Non-motorized Recreation

Many respondents request maintaining opportunity for enjoying the area for hiking and other forms of recreation. Among the benefits expressed are aesthetic and spiritual values, education opportunities, and economic benefits from recreation. Some commented that enhanced trails would benefit citizen management and monitoring. Many others express the view that the proposed Plan would discriminate against young, old and handicapped who require motorized-vehicle access for enjoying the area.

> "There are...plenty of other areas nearby which are available for mountain bike use. Furthermore mountain bike use conflicts with some other uses and could be a safety hazzard on popular hiking and access trails. In order to avoid damage to rugged terrain, sensitive plants and soils, prohibit mountain bike use in the CSEEA."

Pacific Crest National Scenic Trail

Protection and expansion of trail corridors and services such as parking and interpretive information is requested. Equestrians and mountain bikes are not seen as compatible with hiking.

> "It's obvious that some opportunities to protect the PCT have been lost, when former corporate timberlands were cut over, sold and subdivided some 5-10 years ago. Now there are houses close to the trail where it once was just forest. While some landowners like, use and even help maintain the trail, owners change. Future owners may hate the trail and recreationists and be insensitive to the experience (leaving junk, clearcutting, etc.)..."

Combining California and Oregon Jurisdictions

Those in favor of the proposed Plan feel that adding California to the area would address concerns of protection and fragmentation; they generally support as large a designation as possible. Those opposed to the proposed Plan want to keep Oregon and California jurisdictions separate. They generally oppose non-local control.

Planning Consistency

The Federal Land Policy and Management Act (FLPMA), Title II, Section 202, provides guidance for the land use planning system of the Bureau of Land Management (BLM) to coordinate planning efforts with Native American Indian tribes, other Federal departments, and agencies of the state and local governments. In order to accomplish this directive, the Bureau of Land Management is directed to keep informed of state, local, and tribal plans; assure that consideration is given to such plans; and to assist in resolving inconsistencies between such plans and Federal planning. The section goes on to state in Subsection c) (9) that *"Land use plans of the Secretary under this section shall be consistent with State and local plans to the maximum extent he finds consistent with Federal law and the purposes of this Act."*

The provisions of this section of FLPMA are echoed in Section 1610.3 of the BLM Resource Management Planning regulations. In keeping with the provision of this section, state, local and tribal officials were made aware of the planning process through the previously described mailings and meetings. Planning team members also met with local government and tribal officials regarding then CSEEA planning process.

According to Section 1610.4-7 of the Bureau of Land Management Resource Planning Regulations, the Draft CSEEA Management Plan and Draft Environmental Impact Statement is provided to the Governor, other Federal agencies, state and local governments, and Native American Indian tribes for comment. The resulting comments will be addressed in the Proposed Management Plan. The formal 60-day consistency review by the Governor will occur after the Proposed Management Plan is published, as outlined in 1610.3-2(e) of the BLM Planning Regulations.

BLM planning regulations require that RMP amendments be consistent with officially-approved or adopted resource-related plans and the policies and procedures contained thereon, of other federal agencies, state and local governments, and Indian tribes, "so long as the guidance and RMPs are also consistent with the purposes, policies and programs of federal laws and regulations applicable to public lands..."(43 CFR 1610.3-2). Consistency is construed as the absence of conflict. Based on BLM's knowledge of the plans of such other agencies, the DEIS has been compared to the following agencies' plans, for consistency, and BLM has reached the conclusions stated.

Federal Agencies

The DEIS is believed to be consistent with the following plans of other federal agencies:

- The record of decision on the 1994 *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Norhtern Spotted Owl.*

- The Forest Service's forestwide land use plans for the adjacent Rogue River and Klamath National Forest.

- Soil Conservation Service watershed plans.

- The Endangered Species Act and the following Fish and Wildlife Service plans:
  - Pacific Bald Eagle Recovery Plan
  - Final Draft Northern Spotted Owl Recovery Plan
  - Fish and Wildlife Service determination of critical habitat for the Northern Spotted Owl
  - Peregrine Falcon Recovery Plan

- The Bonneville Power Administration's latest annual Transmission System Facilities Resource Program.

- The Northwest Power Planning Council, Columbia River Basin, Fish and Wildlife Program, and subordinate species-specific strategies.

State Government

The DEIS is believed to be consistent with the following plans, programs, and policies of the State of Oregon agencies:

- Department of Environmental Quality
  - Smoke Management Plan
  - Visibility Protection Plan and air quality policies
  - Prevention of Significant Deterioration requirements

- Water Resources Department river basin programs for the Rogue and Klamath rivers

- Water Resources Commission rules and statutes

- Department of Agriculture
  - Weed control plans
  - State-listed endangered plan species

- Division of State Lands
  - Removal - Fill Law
  - Oregon Natural Heritage Program

- Parks and Recreation Department
  - Statewide Comprehensive Outdoor Recreation Plan
  - State Parks and Recreation System Plan
  - State Recreation Trails Plan
  - State Historic Preservation Program
  - State Scenic Waterways Program and related projects

- Department of Transportation, Highway Division
  - Oregon Highway Plan

- Economic Development Department, Regional Economic Development Strategies

Consistency of the alternatives with some of the State plans and programs may be more complex and are addressed in Appendix Y of the Medford District RMP.

Local Government

The Oregon statewide planning program attached substantial importance to the coordination of federal plans with acknowledged local comprehensive plans. To the extent that BLM actions and programs are consistent with acknowledged county and city comprehensive plans and land use regulations, they can also be considered consistent with statewide planning goals. Local plans do not, however, address protection of Goal 5 values from the effects of forest management, as state law prohibits local government from regulating forest practices.

DEIS Distribution List and Availability on the Internet

This Draft Environmental Impact Statement (DEIS) is being sent to the following individuals, groups, and organizations. The list includes 11 elected officials; 10 federal agencies; 22 state and local governments; 7 American Indian Tribes and Nations; 3 libraries, 44 organizations; and approximately 500 individuals.

In addition, the Draft EIS will be available on the internet at <http://www.or.blm.gov/Medford/>.

Elected Officials

Oregon
U.S. Senator Gordon Smith
U. S. Senator Ron Wyden
U.S. Representative Greg Walden
U.S. Representative Peter DeFazio
Jackson County Commissioner Sue Kupillas

California
U.S. Senator Barbara Boxer
U. S. Representative Wally Herger
State Senator Maurice Johannessen State
Assemblyman Dick Dickerson
Siskiyou County Supervisor Joan Smith
Siskiyou County Supervisor Kay Bryan

Federal Agencies

U.S. Department of Agriculture - U.S. Forest Service
Applegate Ranger District
Ashland Ranger District
Goosenest Ranger District
Klamath National Forest
Rogue River National Forest

U. S. Department of Interior - Bureau of Land Management
Redding Field Office
Oregon State Office
Klamath Resource Area
California State Office

U. S. Department of Interior - U.S. Fish and Wildlife Service

State and Local Government

Oregon

Oregon Department of Forestry
Oregon Department of Fish & Wildlife
Southern Oregon University
Oregon State University
University of Oregon
Oregon State Dept. of Transportation
Ore. Dept. of Environmental Quality
Oregon Natural Heritage Program
State Historic Preservation Officer
City of Ashland
Southern Oregon Extension Center
Jackson Co. Farm Bureau

California

California Department of Forestry
California Department of Fish & Game
Siskiyou County Administrator
Siskiyou County APCD
Siskiyou County Planning Department
California Air Resources Board
University of California, Davis

Washington
Northwest Indian Fisheries Commission

Florida
University of Florida

Washington, DC
National Museum of Natural History

American Indian Tribes and Nations

Confederated Tribes of Siletz
Quartz Valley Indian Reservation (Shasta Tribes)
Shasta Nation
Confederated Bands [Shasta] Shasta Upper Klamath Indians
Confederated Tribes of the Rogue-Table Rock and Associated Tribes
Confederated Tribes of Grand Ronde
Klamath Tribes

Libraries

Siskiyou County Library, Yreka Branch
Jackson County Library, Ashland Branch
Southern Oregon University Library, Ashland, Oregon

Organizations

Conservation Biology Institute
Deixis Consultants
U.S. Cellular
Klamath Forest Alliance
Motor Cycle Riders Association
U.S. Timberlands
Friends of the Greensprings
Klamath Siskiyou Wildlands Center
Association of O&C Counties
World Wildlife Fund
Oregon Trout
Aquatic Biology Associates, Inc.
Conservation Biology Institute
California Oregon Broadcasting, Inc.
Native Plant Society
Oregon Natural Resources Council
Klamath Forest Alliance
Kettle Range Conservation Group
KARE
Dukubetede Enviro. Ed.
Southern Oregon Public Television
SW Oregon Province Advisory Comm.
Hutchinson, Anderson, Cox, Coons & DuPriest, P.C.
Aquatic Biology Associates, Inc.
PacifiCorp
AT&T Wireless Services
Klamath Forest Alliance
PNW 4WD Association
Soda Mt. Wilderness Council
Southern Ore. Timber Ind. Assoc.
Headwaters
People for the USA
Pacific Crest Trail Assoc.
Hillcrest Corporation
Conservation Biology Institute
University of California, Davis
Boise Cascade Corporation
Rogue Group Sierra Club
Oregon Natural Desert Association
Friends of the River
Siskiyou Co. Cattleman's Association
Orswell/Walt and Associates
Southern Oregon Public Television
California Wilderness Coalition
Blue Ribbon Coalition

Individuals

Mr. Richard Brock
Ms. Suzy Courtney
Mr. Dauenhauer
Mr. Lee Bradshaw
Mr. Donald Rowlett
Dan Bish
Cavanaugh
John Britton
Harriett Rex Smith
Paul and Robin Noll
JoAnn Cullumbine
Lee Michalson
Ilona [illegible]
Andy Smith
Ramona Osburn
Catherine Edwards
John Zigler
John Hawksley
Dave May
Minte Mendenhall
Fred Obrikat
Jennifer Ledford
John and Betty Reynolds
Bruce Sargent
Jeremy Puma
Diane Meyer
Frank M. Hirst
Dr. Paul Frey
Tam Moore
Mr. Rocky Courtney
Mr. John Fitzgerald
Mr. James Miller
Robert and Carol Doty
Mr. John Ward
Gloria J. Ziller
Fred Harrison
Mary Ellen Thompson
Betty Branch
Chris Fowler
Pat Harris
Val Swanson
Keith Allen Fish
Susan Hunt
Steve Bridges
James Shute
Francee Bounds
Lauren Reese
Chuck Steehly
Myra Erwin
Scott Sonenshine
Tom Rose
Erin Flynn
Charlotte Poulos
Ryan Hunter
Frank and Janice Zern
Stanley G. Meager
John W. Menke
Mr. Curt Crichton
Mr. Russ Davis
Robert and Patricia Miller
Robert & Mary Ann Jones
Pepper Trail
Barbara H. Bean
Jeff Johnson
Nona Forrester
Tom Phillips
Karen Pierce
Erich Reeder
Stan Krute
Vern Crawford
Richard and Maxine Goff
Charles & Kristin Biechler
John Ward
Jim Miller
Daniel S. Kellog
Lee Michalson
Ray Miatke
Paul, Vicki, & Eric Runquist
Culley Polehn
Steve Drabik
Faith Wilcox
Karen Salley
Daniel and Jenelyn Wessler
Ralph Siegrist

Ken Gosling
William D. Rittenhouse
Ms. Cindy M. Harper
Larry Slessle
Gary Schrodt
Shane & Stacy Jobinger
Lynn Reynolds
Robert D. Hungerford
Jeff Golden
Paul Spriggs
Jason Neel
Ms. Avis Adee
Tom and Virginia Angement
Laurie Montero
Richard Hill
John and Kathy Gorham
Brett Clubbe
Erin Madden
Nanette Eckert
Bob Brister
Charlotte Horning
Judith Davis
Stephen Leutza
Dr. Mha Atma Singh Khalsa
Richard Harding
Betty A. Schoenhals
Ellen Clephane
Shelby Maxwell
Richard Colvard
Mark McGranagham
G.T. Smith
Darcy Parkhill
David Jones
Lucretia Smith
Lori J. Cooper
Karen Thompson
Robbin & Angeline Lacy
Richard B. Jensen
Judy Coffman
Carma Kemry
John Stahmer
Robbie Mellows
David Foscue
William Bech
George S. Duggar
Stan Shadle
Susan Cox
Howard Friend
M.R. Niswander
Lynn Berner
Jima Reed
Conny Lindley
Monica Gilman
Bill Drewien
Bill Neil

Billie D. Nicpon
Steve Johnson
Tony Bakker
Ron Pio
Tom Osterman
Edna Epp
Ralph J Quase
Dot Fisher-Smith
Larry Medinger
Chad Bitz
Judy and Michael Heumann
Fritz & Ginger Bachem
Dorothy Layman
Carol Walt
Susan Alexander
Jeffrey Jones
Harry McCabe
Steven Tichenor
Kathy Dean
Johanna and Carl Wright
Thomas F. and Marie-Louise Collier
Donald Fontenot
Mary Lanosa
Margaret Garrington
Joanne Vinton
Marle M. Jandreau
Don Wiljamaa
Joyce Burk
Don Will
Betty J. Linnell
Susan Delles
Dr. Philip K. Johnson
Bruce Donelson
Mr. John O. Koenig
Chuck Ross
Bob Lofgren
John Dutcher
Jack Robins
Greg Walch
John Cordes
David S. Koubeck
Lynn E. Kellogg
Rebecca Smith
Rose M. Thorpe
Jeff Leidecker
Sally Streeter
Karen Sjogren
Bryan/Kristin Cassandro
Gregory S. Hathaway
Matt & Rebecca Whitney
Daniel P. Raleigh
Sandra Moilanen
George Williams
Glen Stonebrink

Mr. & Mrs. John E. VanSyoc
Penny Meads
Rachel Goodman
Stephen Auerbach
Scott Jobinger
Tyrrell P. Hart
Frances Oyung
David and Mary Lea Lemos
David Buckalew
Bob Dutcher
Mrs Robinson
Ronald Love
William and June Holmes
Joan West
Elaine Wood
Ray Kemry
Debra and Anthony Anker
Dennis Nevin
Donald Koch
Irene Brady
Michelle Smith
Marilyn Dinger
Susanna DeFazio
Jim Frings
Emily Savage
J. Van Den Hoogen
Michelle Hofmann
Suzanne Munro
DeWayne E. LaRue
Mark Johnson
M. JoAnn Gilliam
Richard Stevenson
Jerry W. Dawson
Diane Amarotico
Tim Fleming
Will Hislebeard
Don Kemry
Davidd Lexow
George W.Williams
Roxanne Anderson
Anne Foley
Susan Menanno
Marjosie Kellogg
Ms. Annette K. Simonson
John J. Saemann
Larry Kellogg
Pat Cunningham
Mr. & Mrs. R. Alexander
David Rains Wallace
Kristen Robison
Len Eisenberg
Mike Hickey
Jon Elliott

List of Preparers

Matt Broyles, Wildlife Biologist: B.S. Wildlife Management, Humboldt State University; Graduate Study, Southern Oregon State University; 10 years BLM.

Greg Chandler, Fuels Specialist: B.S./M.S. Forestry, Southern Illinois University; 20 years BLM

Cindy Donegan, Writer/Editor Assistance: Student, Southern Oregon State University; 5 years intermittent BLM

Bill Haight, Fisheries Biologist: B.S. Fisheries and Wildlife Management, Oregon State University; 32 years Oregon Department of Fish and Wildlife, 8 years BLM.

Ted Hass, Soil Scientist & Writer/Editor: B.S. Soil Science, California Polytechnic University, Pomona; 2 years Soil Conservation Service; 20 years BLM

Joseph Hoppe, Reality Specialist: B.A. Geography, University of Montana; B.S. Forestry, Oregon State University; 22 years BLM

Dr. Paul Hosten, Ecologist: Ph.D, Utah State University; M.S., University of Natal; B.S.(hons), Rhodes University, South Africa; B.S., University of Port Elizabeth, South Africa.

Howard Hunter, Management Coordination: B.S. Forest Management, Humboldt State University; 22 years BLM.

Tom Jacobs, Rangeland Management Specialist: Graduate study, Rangeland Ecology, Washington State University; B.S. Range Conservation, Washington State University; 27 years BLM.

Dr. Frank A. Lang, Botanist: Ph.D., University of British Columbia; M.S., University of Washington, B.S.; Oregon State University; 30 years Professor of Biology, Southern Oregon University, 3 years BLM.

Laurie Lindell, Hydrologist: M.S. Hydrology and Water Resources, Colorado State University; 20 years BLM.

Kenny McDaniel, Forester: B.S. Forest Management, Utah State University; Graduate study, Oregon State University and University of Washington. 21 years BLM, 2 years USFS.

Jan Miller, Realty Specialist: B.S. Forestry Management, University of Minnesota; 32 years BLM.

Diane Parry, Geology: B.A Geology, Humboldt State University. 14 years BLM
Kevin Preister, Social and Economics: Ph.D., University of California at Davis; 20 years private consultant

Jeannine Rossa, Fisheries Biologist: M.S., Aquatic Ecology, Utah State University. B.S., Wildlife and Fisheries Biology, University of California, Davis. 9 years fisheries and aquatic biologist for private, state and other federal organizations; 8 years BLM.

Dave Russell, Silviculturist: B.S. Forestry and M.S. Forest Pathology, Michigan State University. 19 years BLM

John Samuelson, Forest Engineer: B.S. Forest Management, University of Minnesota; Graduate Study, Oregon State University; 22 years BLM.

Thomas Sensenig, Ecologist: Graduate study, Forest Ecology, Oregon State University; M.S., Silviculture, University of Washington: B.S., Forestry, West Virginia University; 19 years BLM.

Fred Tomlins, Recreation Planner: M.S., Wildland Recreation Management, University of Idaho; B.S., Business Administration, University of California, Berkeley; 21 years BLM.

Brad Tong, Botanist: B.S. Forestry, Humboldt State University, 16 years as a forester and 5 years botanist BLM.

Tim Westfall, Rangeland Management Specialist: M.S. Rangeland Ecology and Management, University of Idaho; B.S. Range Resources / Wildlife Resources, University of Idaho; 22 years range ecology and management, habitat ecology, and riparian ecology for private, state and federal agencies.

Dr. Kate Winthrop, Archeologist: Ph.D., University of Oregon; M.A., University of Minnesota; A.B., University of California, Berkeley; 10 years cultural resources consultant; 8 years BLM.

Larry Zowada, Geographic Information Specialist: B.S. Forestry Resource Management, University of Idaho; 3 years Forest Service, 22 years BLM

The Planning Team would like to thank the following people for their assistance in preparing this Draft Management Plan and Draft Environmental Impact Statement:

Ken Brown
Lorie List
Cheryl Nelson
Eric Stone
Cindy Donegan
James Langhoff
Karen Bolda
Robyn Hertz
Cliff McClelland
Nancy Stevens
Don Ferguson
Jim Round
Michael Hamel

Glossary

AIR QUALITY: A measure of the health-related and visual characteristics of the air, often derived from quantitative measurements of the concentrations of specific injurious or contaminating substances.

AIR QUALITY CLASS I AND II AREAS: Regions in attainment areas where maintenance of existing good air quality is of high priority. Class I areas are those that have the most stringent degree of protection from future degradation of air quality. Class II areas permit moderate deterioration of existing air quality.

ALLOCATION: Process to specifically assign use between and ration among competing users for a particular area of public land or related waters.

ALLOTMENT: An area allocated for livestock use by one or more qualified grazing permittees including prescribed numbers and kinds of livestock under one plan of management.

ALLOTMENT MANAGEMENT PLAN (AMP): A written program of livestock grazing management including supportive measures, if required. An AMP is designed to attain specific management goals in a grazing allotment and is prepared cooperatively with the permittee(s) or lessee(s).

ALL-TERRAIN VEHICLE (ATV): All-terrain vehicle - 42" width or smaller. A small, amphibious motor vehicle with wheels or tractor treads for traveling over rough ground, snow, or ice, as well as on water.

ALTERNATIVE: One of at least two proposed means of accomplishing planning objectives.

ANALYSIS: The examination of existing and/or recommended management needs and their relationships to discover and display the outputs, benefits, effects, and consequences of initiating a proposed action.

ANIMAL UNIT MONTH (AUM): The amount of forage required to sustain the equivalent of 1 cow for 1 month; 1 wild horse for 1 month; or 5 sheep for 1 month; 8.9 deer for 1 month (winter season), 5.8 deer for 1 month (summer season); 9.6 antelope for 1 month; 5.5 bighorn sheep for 1 month; 2.2 burros for 1 month; 1.2 elk for 1 month (winter season) or 2.1 elk for 1 month (year-long) (usually 800 lbs. of useable air-dried forage).

APPROPRIATE ACTION: implementing actions pursuant to subparts 4110, 4120, 4130 and 4160 of the regulations that will result in significant progress toward the fulfillment of the standards and significant progress toward conformance with guidelines (see Significant Progress).

ASSESSMENT: A form of evaluation based on the standards of rangeland health, conducted by an interdisciplinary team at the appropriate landscape scale(pasture, allotment, sub-watershed, watershed, etc.) To determine conditions relative to standards.

AQUATIC: Living or growing in or on the water.

AQUIFER: Stratum or zone below the surface of the earth capable of producing water, as from a well. A saturated bed, formation, or group of formations which yield water in sufficient quantity to be of consequence as a source of supply. An aquifer acts as a transmission conduit and storage reservoir.

ARCHAEOLOGY: The scientific study of the life and culture of past, especially ancient, peoples, as by excavation of ancient cities, relics, artifacts, etc.

AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC): An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources, or other natural systems or processes, or to protect life/provide safety from natural hazards.

BOARD FOOT: A unit of measurement equal to an unfinished board foot square by one inch thick.

BIODIVERSITY: The variety of life and its processes, and the interrelationships within and among various levels of ecological organization. Conservation, protection, and restoration of biological species and genetic diversity are needed to sustain the health of existing biological systems. Federal resource management agencies must examine the implications of management actions and development decisions on regional and local biodiversity.

BRYOPHYTES: Plants of the phylum Bryophyta, including mosses, liverworts, and hornworts, characterized by the lack of true roots, stems and leaves.

CANDIDATE SPECIES: Those plants and animals included in the Federal Register "Notices of Review" that are being considered by the U.S. Fish and Wildlife Service for listing as threatened or endangered. Two categories that are of primary concern: Category 1 - Taxa for which there is substantial information to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work. Category 2 - Taxa information indicates that listing is possibly appropriate. Additional information is being collected.

COMMERCIAL THINNING: The removal of generally merchantable trees from an even-aged stand, usually to encourage growth of the remaining trees.

COMPACTION LAYER: A layer within the soil profile in which the soil particles have been rearranged to decrease void space, thereby increasing soil bulk density and often reducing permeability.

CONNECTIVITY: A measure of the extent to which conditions among late-successional/old-growth (LS/OG) forest areas provide habitat for breeding, feeding, dispersal, and movement of LS/OG associated wildlife and fish species.

CONSULTATION: Formal consultation is a process that occurs between the U.S. Fish and Wildlife Service(USFWS) or the National Marine Fisheries Service(NMFS) and a federal agency that commences with the federal agency's written request for consultation under Section 7(a)(2) of the Endangered Species Act regarding a federal action which may affect a listed species or its critical habitat. It concludes with the issuance of the biological opinion under Section 7(b)(3) of the Act. Informal consultation is an optional process that includes all discussions, correspondence, etc., between the USFWS or NMFS and the federal agency, or the designated non-federal representative, prior to formal consultation, if required. If the listing agency determines that there is no likely adverse affect to the listed species, it may concur with the action agency that formal consultation is unnecessary.

CUBIC FEET PER SECOND (cfs): As a rate of stream flow, a cubic foot of water passing a referenced section in 1 second of time. One cfs flowing for 24 hours will yield 1.983 acre-feet of water.

CULTURAL RESOURCES: Those resources of historical and archaeological significance.

CUMULATIVE EFFECTS: Those effects on the environment that result from the incremental effect of the action when added to past, present, and reasonably foreseeable future actions regardless of what agency or person(s) undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

DECOMMISSION: To remove those elements of a road that reroute hillslope drainage and present slope stability hazards. This usually involves removing the culverts, ripping the road prism, installing drainage facilities (i.e. waterbars, waterdips, etc.), and replanting the road surface with grasses, legumes, shrubs, and trees.

DEGREE OF FUNCTION: A level of physical function relative to properly functioning condition commonly expressed as: properly functioning, functioning-at-risk, or non-functional.

DESIGNATED ROAD: A linear "transportation facility" on which state-licensed, four wheeled vehicles can travel. By definition, these do not qualify as trails.

DIRT BIKE: Non-street legal motorcycle.
DISPERSAL HABITAT: Habitat that supports the life needs of an individual animal during dispersal. Generally satisfies needs for foraging, roosting, and protection from predators.

DIVERSITY: The aggregate of species assemblages (communities), individual species, and the genetic variation within species and the processes by which these components interact within and among themselves. The elements of diversity are: 1. Community diversity (habitat, ecosystem), 2. Species diversity and 3. Genetic diversity within a species; all three of which change over time.

EASEMENT: A right or privilege one may have on another's land.

ECOSYSTEM: A system made up of a community of animals, plants, and micro-organisms and its interrelated physical and chemical environment.

ECOTONE: A transition zone between two plant communities that usually contain some ecological features of each of the two associations but with structural and functional features of its own.

EDAPHIC: Relating to the soil

ENDANGERED SPECIES: Any animal or plant species in danger of extinction throughout all of a significant portion of its range. These species are listed by the U. S. Fish and Wildlife Service.

ENDEMIC: A species that is unique to a specific locality.

ENERGY FLOW: The process in which solar energy is converted to chemical energy through photosysthesis and passed through the food chain until it is eventually dispersed through respiration and decomposition.

ENDOGENOUS DISTURBANCE: Disturbance that originates from within the ecosystem.

EPHEMERAL STREAM: A stream that flows only in direct response to precipitation, and whose channel is at all times above the water table.

EQUESTRIAN: Of horses, horsemen, or horseback riding.

FAUNA: The animals of a specified region or time.

FLOODPLAIN: A plain along a stream or river onto which the flow spreads at flood stage.

FLORA: The plants of a specified region or time.

FORAGE: Vegetation of all forms available and of a type used for animal consumption.

FORMATION: The primary unit in stratigraphy consisting of a succession of strata useful for mapping or description. Most formations possess certain lithologic features that may indicate genetic relationships.

FOSSIL: The remains or traces of animals or plants which have been preserved by natural causes in the earth's crust exclusive of organisms which have been buried since the beginning of historic times.

FOREST HEALTH RESERVE (FHR): A district designation for forest land in the CSEEA that promotes a healthy forest with a balance of seral stages.

FOUR-WHEEL-DRIVE (4WD): Four-wheel-drive, differential transfer case disperses 50/50 front and rear displacement. Trucks, cars, buses, or sport utility vehicles with high clearance and the ability to operate off-pavement as well as on highways.

FUNCTIONING-AT-RISK: Riparian-wetland areas that are in functional condition but an existing soil, water, or vegetation attribute makes them susceptible to degradation.

GEOLOGY: The science which studies the Earth, the rocks of which it is composed, and the changes it has undergone or is undergoing.

GRAZING ALLOTMENT CATEGORIES: Direction under which all grazing allotments are categorized for management purposes into three groups. The overall objectives are: M-maintain the current resource conditions; I-improve the current resource conditions; and C-custodial manage the existing resource values.

GRAZING PERMIT: An authorization which allows grazing on public lands. Permits specify class of livestock on a designated area during specified seasons each year. Permits are of two types: preference (10 year) and temporary nonrenewable (1 year).

GRAZING PREFERENCE: The total number (active and suspended non-use) of animal unit months of livestock grazing on public land apportioned and attached to base property owned or controlled by a permittee.

GRAZING SYSTEM: A prescribed method of grazing a range allotment having two or more pastures or management units to provide periodic rest for each unit.

GROUND WATER: Water in the ground that is in the zone of saturation; water in the ground that exists at, or below the water table.

GUIDELINE: Practices, methods, techniques and considerations used to ensure that progress is made in a way and at a rate that achieves the standard(s).

GULLY: A channel resulting from erosion and caused by the concentrated but intermittent flow of water usually during and immediately following heavy rains.

HABITAT: A specific set of physical conditions in a geographic area(s) that surrounds a single species, a group of species, or a large community. In wildlife management, the major components of habitat are food, water, cover, and living space.

HABITAT FRAGMENTATION: The breakup of extensive habitats into small, isolated patches that are too limited to maintain their species stocks into the indefinite future.

HEADWATER CAPTURING: Extensive flooding at the end of an ice age which may have allowed native populations in some headwater streams to transfer to others.

HYDROLOGIC CYCLE: The process in which water enters the atmosphere through evaporation, transpiration, or sublimation from the oceans, other surface water bodies, or from the land and vegetation, and through condensation and precipitation returns to the earth's surface. The precipitation then occurring as overland flow, stream flow, or percolating underground flow to the oceans or other surface water bodies or to other sites of evapo-transpiration and recirculation.

HYDROLOGY: The science dealing with the properties, distribution, and circulation of water.

IMPACT: Synonymous with effects. Includes ecological, aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Impacts may also include those resulting from actions which may have both beneficial and detrimental (adverse) effects. Impacts may be considered as direct, indirect, or cumulative:

- Direct: Impacts caused by an action an occurring at the same time and place.
- Indirect: Impacts caused by the proposed action and occurring later in time or farther removed in distance, but are still reasonably foreseeable.
- Cumulative: Those which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions.

INDICATORS: Parameters of ecosystem function that are observed, assessed, measured, or monitored directly or indirectly determine attainment of a standard(s).

INFILTRATION: The downward entry of water into the soil.

INFILTRATION RATE: The rate at which water enters the soil.

INHOLDING: A non-federal parcel of land that is completely surrounded by federal land.

INTERIM MANAGEMENT POLICY (IMP): An interim measure governing lands under wilderness review. This policy protects Wilderness Study Areas from impairment of their suitability as wilderness.

INTERMITTENT STREAM: Seasonal stream. A stream that flows only at certain times of the year when it receives water from springs or from some surface source, such as melting snow in mountainous areas.

INVERTEBRATE SPECIES: Any animal without a backbone or spinal column.

KEY WATERSHED: As defined by National Forest and Bureau of Land Management District fish biologists, a watershed containing (1) habitat for potentially threatened species of stocks of anadromous salmonids or other potentially threatened fish, or (2) greater than six square miles with high quality water and fish habitat.

KIND OR CLASS OF LIVESTOCK:
- Kind: The species of domestic livestock- cattle and sheep.
- Class: The age class (i.e., yearling or cows) of a species of livestock.

LAND USE PLAN: A plan that reflects an analysis of activity systems and a carefully studied estimate of future land requirements for expansion, growth control, and revitalization or renewal. The plan shows how development in the area should proceed in the future to insure the best possible physical environment for living, the most economic and environmentally sensitive use of land, and the proper balance in use. The land use plan embodies a proposal as to how land should be used in the future, recognizing local objectives and generally accepted principals of health, safety, convenience, economy, and general living amenities.

LATE-SUCCESSIONAL FOREST: Forest seral stages which include mature and old-growth age class.

LEASE: An authorization or contract by which one party (lessor) conveys the use of property, such as real estate, to another (lessee) in return for rental payments.

LEASABLE MINERAL: A mineral such as coal, oil shale, oil and gas, phosphate, potash, sodium, geothermal resources, and all other minerals that may be developed under the Mineral Leasing Act of 1920, as amended.

LOCATABLE MINERAL: Any valuable mineral that is not saleable or leasable including gold, silver, copper, uranium, etc., that may be developed under the General Mining Law of 1872.

MINERAL ENTRY: The location of mining claims by an individual to protect his/her right to a valuable mineral.

MINERAL MATERIALS: Refer to saleable minerals.

MINERAL POTENTIAL:

•High:	Those lands currently producing locatable or leaseable minerals or having high current industry interest.
•Moderate:	Those lands which have had locatable or leaseable minerals in favorable geologic environments.
•Low:	Those lands where either the geologic environment appears to be favorable for the accumulation of locatable or leaseable minerals, or where little or no information is available to evaluate the mineral potential.

MINERAL WITHDRAWAL: A withdrawal of public lands which are potentially valuable for leasable minerals. This precludes the disposal of the lands except with a mineral reservation, unless the lands are found to not be valuable for minerals.

MITIGATING MEASURES: Constraints, requirements, or conditions imposed to reduce the significance of or eliminate an anticipated impact to environmental, socioeconomic, or other resource value from a proposed land use. Committed mitigating measures are those measures BLM is committed to enforce (i.e., all applicable laws and their implementing regulations).

MONITORING: A process of collecting information to evaluate if objective and anticipated or assumed results of a management activity or plan are being realized or if implementation is proceeding as planned.

MONTMORILLONITIC CLAY: Soils with aluminum/silicate clays with an expanding crystal lattice. Montmorillonitic clays have a high shrink/swell ratio which results in large cracks in the soil when it is dry and swelling upon wetting. These soils are, generally, very sticky and slippery when wet.

MOUNTAIN BICYCLE: Bicycle designed for off-pavement use. Generally are multi-geared with fat knobby tires. Frames and tire rims are stronger than road bicycles. Sometimes referred to in this document as a non-motorized vehicle.

NATURALNESS: An area which "generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable." (Section 2c, WILDERNESS ACT).

NON-FUNCTIONING: Riparian-wetland areas that clearly are not providing adequate vegetation, landform, or large woody debris to dissipate stream energy associated with high flows.

NOXIOUS WEEDS: Those plants which are injurious to public health, agriculture, recreation, wildlife, or any public or private property.

NUTRIENT CYCLING: The movement of essential elements and inorganic compounds between the reservoir pool (soil, for example) and the cycling pool (organisms) in the rapid exchange (i.e., moving back and forth) between organisms and their immediate environment.

OFF-HIGHWAY VEHICLES (OHV): Any motorized vehicle designed for or capable of cross-country travel over lands, water, sand, snow, ice, marsh, swamp-land, or other terrain.

OFF-HIGHWAY VEHICLE DESIGNATIONS:

- Open: Designated areas where OHVs may be operated.
- Limited: Designated areas and trails where the use of an OHV is subject to restrictions, such as limiting the dates and times of use (seasonal restrictions); limiting use to designated roads and trails; limiting use to existing roads and trails. Combinations of restrictions are possible.
- Closed: Designated areas, roads, and trails where the use of an OHV is permanently or temporarily prohibited. Emergency use of vehicles is allowed.

OLD-GROWTH FOREST: A forest stand usually at least 180-220 years old with moderate to high canopy closure; a multi-layered, multi-species canopy dominated by large overstory trees; high incidence of large trees, some with broken tops and other indications of old and decaying wood (decadence); numerous large snags; and heavy accumulations of wood, including large logs on the ground.

ORGANIC MATTER: Plant and animal residues accumulated or deposited at the soil surface; the organic fraction of the soil that includes plant and animal residues at various stages of decomposition; cells and tissues of soil organisms, and the substances synthesized by the soil population.

OUTSTANDING: Standing out among others of its kind; distinguished; excellent.

PALEONTOLOGY: The branch of geology that deals with life forms from the past, especially prehistoric life forms, through the study of plant and animal fossils.

PERCHED WATER TABLE: Water table above an impermeable bed underlain by unsaturated rocks of sufficient permeability to allow movement of ground water.
PERENNIAL STREAM: A stream that flows continuously. Perennial streams are generally associated with a water table in the localities through which they flow.

PERMIT: A short-term, revocable authorization to use public lands for specific purposes.

PERMITTEE: (Livestock Operator) A person or organization legally permitted to graze a specific number and class of livestock on designated areas of public land during specified seasons each year.

PERMEABILITY: The ease with which gases, liquids or plant roots penetrate or pass through bulk mass of soil or a layer of soil.

PETRIFIED WOOD: Fossilization of wood through introduction or replacement by silica (silicified wood) in such a manner that the original form and structure of the wood is preserved.

PHYSIOGRAPHIC REGION: Region of similar geologic structure and climate with a unified history of land formation.

PRESCRIBED FIRE: Controlled application of fire to natural fuels under conditions of weather, fuel moisture, and soil moisture that will allow confinement of the fire to a predetermined area and, at the same time, will produce the intensity of heat and rate of spread required to accomplish certain planned benefits to one or more objectives to wildlife, livestock, and watershed values. The overall objectives are to employ fire scientifically to realize maximum net benefits at minimum environmental damage and acceptable cost.

PREY SPECIES: An animal taken by a predator as food.

PROBABLE SALE QUANTITY (PSQ): Probable sale quantity is the gross amount of timber volume, including salvage, that may be sold annually from a specified area over a stated period in accordance with management plans of the BLM. PSQ includes only scheduled or regulated yields from Matrix land and does not include "other wood" such as that taken from the LSR.

PROPER GRAZING USE: Grazing that, through the control of timing, frequency, intensity and duration of use, meets the physiological needs of the desirable vegetation, provides for the establishment of desirable plants and is in accord with the physical function and stability of soil and landform (properly functioning condition).

PROPERLY FUNCTIONING CONDITION (PFC): Riparian-wetland areas are functioning properly when adequate vegetation, landform, or large woody debris is present to dissipate stream energy associated with high water flows, thereby reducing erosion and improving water quality; filter sediment; capture bedload, and aid floodplain development; improve flood-water retention and ground-water recharge; develop root masses that stabilize streambanks against cutting action; develop diverse ponding and channel characteristics to provide the habitat and the water depth, duration, and temperature necessary for fish production, waterfowl breeding, and other uses; and support greater biodiversity.

RANGELAND IMPROVEMENTS: Any activity or program on or relating to rangelands that is designed to improve forage production, change vegetation composition, control patterns of use, provide water, stabilize soil and water conditions, and enhance habitat for livestock, wildlife, and wild horses and burros. Rangeland improvements include land treatments (e.g., chaining, seeding, burning, etc.), stockwater developments, fences, and trails.

RAPTORS: Birds of prey, such as the eagle, falcon, hawk, owl, or vulture.

REFERENCE AREA: Sites that, because of their condition and degree of function, represent the ecological potential or capability of similar sites in an area of region (ecological province); serve as a benchmark in determining the ecological potential of sites with similar soil, climatic, and landscape characteristics.

RELICT PLANT COMMUNITY: Areas of plants that have persisted despite the pronounced warming and drying of the interior west over the last few thousand years and/or have not been influenced by settlement and post-settlement activities.

RESEARCH NATURAL AREA (RNA): An area set aside by a public or private agency specifically to preserve a representative sample of an ecological community, primarily for scientific and educational purposes. RNAs are areas designated to ensure representative samples of as many of the major naturally occurring plant communities as possible are preserved. The public may be excluded or restricted from such areas to protect studies.

RIGHT-OF-WAY: Federal land authorized to be used or occupied for the construction, operation, maintenance, and termination of a project, pursuant to a R-O-W authorization.

RILL: A small, intermittent water course with steep sides; usually only a few inches deep.

RIPARIAN HABITAT: Riparian habitat is defined as an area of land directly influenced by permanent (surface or subsurface) water. They have visible vegetation or physical characteristics reflective of permanent water influence. Lake shores and stream-banks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

RIPARIAN VEGETATION: Plants adapted to moist growing conditions along streams, waterways, ponds, etc.

ROUTE: A path, way, trail, road, or other established travel corridor.

SALEABLE MINERALS: Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

SEASON-OF-USE: The timing of livestock grazing on a rangeland area.

SEDIMENT YIELD: The quantity of soil, rock particles, organic matter, or other dissolved or suspended debris is transported through a cross-section of stream in a given period. Measured in dry weight or by volume.

SENSITIVE SPECIES: Those species that (1) have appeared in the Federal Register as proposed for classification and are under consideration for official listing as endangered or threatened species or (2) are on an official state list or (3) are recognized by the BLM as needing special management to prevent their being placed on Federal or state lists.

SERAL STAGES: The series of relatively transitory plant communities that develop during ecological succession from bare ground to climax stage.

SIGNIFICANT PROGRESS: When used in reference to achieving a standard: (actions), the necessary land treatments, practices and/or changes to management have been applied or are in effect, (rate) a rate of progress that is consistant with the anticipated recovery rate described in plan objectives, with due recognition of the effects of climatic extremes (drought, flooding, etc.), fire, and other unforseen naturally occurring events or disturbances. Monitoring reference areas that are ungrazed and properly grazed may provide evidence of appropriate recovery rates. (See Proper Grazing Use).

SILVICULTURAL SYSTEM: A planned sequence of treatments or prescriptions over the entire life of a forest stand needed to meet management objectives.

SOIL DENSITY (bulk density): the mass of dry soil per unit bulk volume.

SOIL MOISTURE: Water contained in the soil; commonly used to describe water in the soil above the water table.

SPECIAL STATUS SPECIES: Wildlife and plant species either Federally listed or proposed for listing as endangered or threatened; state-listed or BLM determined priority species.

SPECIES OF LOCAL IMPORTANCE: Species of significant importance to Native American populations (e.g., medicinal and food plants).

SUSPENDED: Term used when describing an administrative state of mining operations or oil, gas, and mineral leases, whereby the operation or lease is "suspended" or on standby while an administrative action is contemplated. When mineral leases are suspended, the lessee cannot explore, develop, or otherwise enjoy the benefits of the lease. Also, the term (time period) of the lease is suspended.

THREATENED SPECIES: Any animal or plant species likely to become endangered within the foreseeable future throughout all of a significant portion of its range. These species are listed by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service in accordance with the 1973 Endangered Species Act and published in the Federal Register.

TIMBER MANAGEMENT: A general term for the directing, managing or controlling of forest crops and stand of trees.

TIMBER PRODUCTION: The purposeful growing, tending, harvesting, and regeneration of regulated crops of trees to be cut into logs, bolts, or other round sections for industrial or consumer use other than for fuelwood.

TOPOGRAPHY: The accurate and detailed description of a place.

TOTAL DISSOLVED SOLIDS (TDS): The total quantity (reported in milligrams per liter) of dissolved materials in water.

TRAIL: A created or evolved "transportation facility" administratively designated for certain types of use. Examples include hiking, equestrian, snowmobile, cross country skiing, motorcycles, off-highway vehicles.

TREND IN RANGE CONDITION: An interpretation of the direction of change in range condition. These determinations may relate to ecological site or forage conditions. Also vegetation trend that is improving (upward) not changing (static) and declining (downward).

TWO-WHEEL-DRIVE (2WD): Vehicle clearance generally lower than with a 4WD. Not designed to travel off-pavement.

UPLANDS: Lands that exist above the riparian/wetland area, or active flood plains of rivers and streams; those lands not influenced by the water table or by free or unbound water; commonly represented by the toe slopes, alluvial fans, side slopes, shoulders and ridges of mountain and hills.

UTILITY: A service provided by a public utility, such as electricity, telephone, or water.
VEGETATION RESTORATION METHODS: Mechanical, chemical, biological, and fire vegetation treatments used to restore and promote a natural range of native plant associations. Treatments are designed for specific areas and differ according to the area's suitability and potential. The most common land treatment methods alter the vegetation by spraying with pesticides, burning, or plowing, followed by seeding with native plant species.

VERTEBRATE SPECIES: Any animal with a backbone or spinal column.

VISITOR DAY: Twelve visitor hours which may be aggregated by one or more persons in single or multiple visits.

VISITOR USE: Visitor use of a resource for inspiration, stimulation, solitude, relaxation, education, pleasure, or satisfaction.

VISUAL RESOURCE MANAGEMENT (VRM) CLASSES: Management classes are determined on the basis of overall scenic quality, distance from travel routes, and sensitivity to change.

> Class I: Provides primarily for natural ecological changes only. It is applied to wilderness areas, some natural areas, and similar situations where management activities are to be restricted.
>
> Class II: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> Class III: Changes in the basic elements caused by a management activity may be evident in the characteristic landscape, but the changes should remain subordinate to the visual strength of the existing character.
>
> Class IV: Changes may subordinate the original composition and character but must reflect what could be a natural occurrence within the characteristic landscape.

WATERSHED: All land and water within the confines of a drainage divide.

WATERSHED ANALYSIS: A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning.

WATERSHED FUNCTION: The principle functions of a watershed include the capture of moisture contributed by precipitation; the storage of moisture within the soil profile, and the release of moisture through subsurface flow, deep percolation to groundwater, evaporation from the soil, and transpiration by live vegetation.

WAY: A path, trail, or other established travel corridor.

WETLANDS: Lands including swamps, marshes, bogs, and similar areas, such as wet meadows, river overflows, mud flats, and natural ponds.

WILDERNESS AREA: Areas designated by congressional action under the 1964 Wilderness Act. Wilderness is defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature with the imprint on human activity substantially unnoticeable; have outstanding opportunities for solitude or for a primitive and confined type of recreation; include at least 5,000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, education, scenic, or historical value as well as ecological and geological interest.

WILDERNESS STUDY AREA (WSA): Areas under study for possible inclusion as a Wilderness Area in the National Wilderness Preservation System.

WILDFIRE: Any wildland fire that does not meet management objectives, thus requiring a fire suppression response. Once declared a wildfire, the fire can no longer be declared a prescribed fire.

WINDTHROW: A tree or trees uprooted or felled by the wind.

WITHDRAWAL: Removal or "withholding" of public lands from operation of some or all of the public land laws (settlement, sale, mining, and/or mineral leasing). An action which restricts the use or disposal of public lands, segregating the land from the operation of some or all of the public land and/or mineral laws and holding it for a specific public purpose. Withdrawals may also be used to transfer jurisdiction of management to other Federal agencies.

References

Agee JK. 1991. Fire history along an elevational gradient in the Siskiyou Mountains, Oregon. Northwest Sci 65: 188-99.

Agee JK. 1993. Fire ecology of Pacific Northwest forests, Covelo (CA): Island Pr. 493 p.

Agee JK. 1998. The landscape ecology of western fire regimes. Special Issue. Northwest Sci 72: 24-34.

Alexander JD. 1999. Baseline inventory of breeding birds in the Oregon Gulch and Scotch Creek Research Natural Areas, and the Agate Flat Area of the Cascade/ Siskiyou Ecological Emphasis Area. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management.

Anderson HE. 1982. Aids to determining fuel models for estimating fire behavior. Ogden (UT): U.S. Department of Agriculture. U.S. Forest Service.

Anderson J. 1998. Regional economic profile, Region 8. Salem (OR): Oregon Employment Department.

Anderson J. 2000. Regional economic profile, Region 8. Salem (OR).: Oregon Employment Department.

Anonymous. 1985. Butterflies recorded on Soda Mountain, Jackson Co, Oregon, from State Highway 66 to Summit. Unpublished Species List. On file Medford (OR) District, Bureau of Land Management. 1 p.

Anonymous. 1988. Hobart Lake Study. Unpublished report. Medford (OR): Medford District, Bureau of Land Management.

Atzet T. 1990. Preliminary plant associations of the Southern Oregon Cascade Province. Grants Pass (OR): Siskiyou National Forest.

Atzet T. Wheeler D.L. 1982. Historical and ecological perspectives on fire activity in the Klamath geological province of the Rogue River and Siskiyou National Forests. Pub. R-6-Range-102 ed. Portland (OR): U.S. Department of Agriculture, U.S. Forest Service, Pacific Northwest Region.

Atzet T, White D, McCrimmon L, Martinez P, Fong P, Randall V. 1996. Field guide to the forested plant associations of southwestern Oregon. Tech paper R6-NR-ECOL-TP-17-96 Portland (OR): USDA, Forest Service, Pacific Northwest Region.

Benoche D. 1999. Siskiyou Sundays: A Tour of Southwestern Oregon. Ashland (OR): Don Benoche, 439 Herbert St. 148 p.

Bessey, R. 1988. Information review for Jenny Creek ACEC. Draft report. Medford (OR): Medford District, Bureau of Land Management. Oregon 4 p.

Benke RJ. 1992. Native trout of Western North America. American Fisheries Society Monograph No. 6. Bethesda (MD): Am Fisheries Soc. 275 p.

Bestland E. 1987. Volcanic stratigraphy of the Oligocene Colestin Formation in the Siskiyou Pass area of Southern Oregon. Oregon Geol 49 (7): 79-86.

Brady NC. 1974. The nature and properties of soil. New York: MacMillan. 639 p.

Brock R. 1988. Botanical values in the proposed Soda Mountain Wilderness. Unpublished report. Medford (OR): Medford District, Bureau of Land Management. 5 p.

Brock R, Callagan R. 1999a. Scotch Creek RNA plant community inventory. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management. 9p plus tables.

Brock R. 1990. Plant species of interest in the proposed Siskiyou Mountains Natural Area. Appendix B. In: Prevost ME, Brock R, Ormsby T, Ebersole J. Proposal for the Siskiyou Mountains Natural Area ACEC. Submitted Proposal. Medford (OR): Medford District, Bureau of Land Management.19 p.

Brock R, Callagan R. 1999a. Scotch Creek RNA 1999 survey. Special status plant summary. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management. 2 p.

Brock R, Callagan R. 1999b. Scotch Creek RNA 1999 plant community inventory. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management. 9 p.

Browning RM. 1975. The distribution of the birds of Jackson County and surrounding areas. North American Fauna 70. Washington (DC): US Fish Wildlife Ser. 69 p.

Broyles M, Donham K. 1996. Soda Mountain Area Butterflies, Jackson County, Oregon. Unpublished species list. Collected 1993-1996. Medford (OR): Medford District, Bureau of Land Management. 4 p.

Byers WB, Lindahl DP, Hamill E.1995. Lone eagles and other high fliers in the rural producer services. Pacific Northwest Regional Economic Conference. Missoula (MT): May

CRWQCB (California Regional Water Quality Control Board). 1997. Santa Rosa (CA): Water quality control plan for the North Coast region.

Callahan F. 1999. Botanical reconnaissance and weed survey of Cascade/Siskiyou Ecological Emphasis Area excluding Pilot Rock Area. Unpublished Report. Medford (OR): Medford District, Bureau of Land Management.

Carroll C, Noss RF, Strittholt JR. The wolf as a focal species for regional conservation planning: A reintroduction feasibility study for the Klamath Region. In: Defenders of wildlife's restoring the wolf conference proceedings. Seattle (WA): Defenders of Wildlife. p 69-76.

Clark PE, Krueger WC, Bryant LD, Thomas D. R. 2000. Livestock grazing effects on forage quality of elk winter range. J Range Manage 53: 97- 105

Coleman RG, Kruckeberg AR. (1999). Geology and plant life of the Klamath- Siskiyou mountain region. Nat Areas J. 19(4): 320-340.

Cross S. 1999. Evaluating the potential occurrence of three species of bats in the vicinity of Pilot Rock, Jackson County, Oregon. Unpublished report. Medford District BLM. 3 p.

Currens KP. 1990. Genetic variation of rainbow trout (*Onchorynchus mykiss*) in Jenny Creek, Oregon. Report for Medford District BLM by Oregon Cooperative Fishery Research Unit, OSU, Corvallis, OR. 26 p.

Currens KP. 1997. Evolutionary ecology of redband trout. In: Evolution and Risk in Conservation of Pacific Salmon. Ch. 2 [PhD thesis]. Corvallis (OR): Oregon State Univ. p 4-52.

D'Allura J. 1997. Preliminary geologic map of the southwest part of the Medford 30 x 60 Quad, Open File report 0-97-3, DOGMI.

DellaSala DA, Reid SB, Frest TJ, Strittholt JR, Olson DM. 1999. A global perspective on the biodiversity of the Klamath-Siskiyou Ecoregion. Nat Areas J. 19(4): 300-319.

Detling L. 1961. The chaparral formation of southwestern Oregon, with considerations of its postglacial history. Ecology 42:348-357.

Dodge NA. 1975. A Climbing Guide to Oregon. Beaverton (OR): The Touchstone Press. 116-117 p.

Doeksen A, Cordes S, Shaffen R. [n.d.] Health Care's contribution to rural economic development. Rockville (MD): Office of Rural Health Policy, Health Services Administration.

Dow J. 1995. Siskiyou Pass Land Acquisition Reconnaissance Map and Notes. Unpublished Report. Medford District BLM 2 p.

Finney MA. 1997. FARSITE fire area simulator, users guide and technical documentation. Version 3.0. Missoula (MT): Systems for Environmental Management. 147 p.

Finney MA, Ryan KC. 1996. Use of the FARSITE fire growth model for fire prediction in U.S. National Parks. In: Proc International emergency management and engineering conference. Sullivan JD, Wybo JL, Buisson L, editors. Paris France: International Emergency Management and Engineering Society. p 186-192.

Follansbee JA, Pollock NL. 1978. Prehistory and history of the Jackson-Klamath Planning Unit: A cultural resources overview, with M.A. Duenwald, R. K. Sutton and W. Orr. Medford (OR): Medford District, Bureau of Land Management.

Fossom H. 1996. Lone eagles thrive in the Northwest. The Changing Northwest, Newsletter of the Northwest Policy Center, Univ of Washington Graduate School of Public Affairs, 8 (2): October. n. page. Online. Internet. Available WWW :http:// depts. washington.edu /npcbox/O96_Eagles.html

Fox L, Bonser GL, Trehey GH. Buntz RM, Jacoby CE. Barston AP, La Brie DM. 1997. A Database and map of existing vegetation in the Klamath Bioregion derived from Landsat Imagery, Version 1.0. Arcata (CA): Klamath Bioregional Assessment Project. Humboldt State Univ.

Franklin JF, Dyrness CT. 1988. Natural vegetation of Oregon and Washington. Corvallis (OR): Oregon State Univ Pr. 452 p.

Frest TJ, Johannes EJ. 1999. Mollusk survey of Southwest Oregon, with emphasis on the Rogue and Umpqua River Drainages. Unpublished report. Seattle (WA): Deixis Consultants. 287 p.

Halpern CB, Spies TA. 1995. Plant species diversity in natural and managed forests of the Pacific Northwest. Ecol Appl. 5(4): 913-934.

Harris P, Currens K. 1993. Biochemical taxonomy of Klamath Smallscale Suckers, *Catostomus rimiculus* Gilbert and Snyder, from Jenny Creek and Rogue River, Oregon, and Scott River and Shovel Creek, California. Unpublished report. Medford (OR): Bureau of Land Management. 16 p.

Hohler DB. 1981. A dwarfed population of *Catostomus rimiculus* (*Catostomidae: Pisces*) in Jenny Creek, Jackson County, Oregon. [MSc Thesis]. Corvallis (OR): Oregon State Univ. 76 p.

Holthausen RS, and others.1992. Results of additional species analysis -Mollusks. Appendix J2, Final Supplemental Environmental Impact Statement. (Entry by Dr. Joseph Furnish). Washington (DC): USDA Forest Service and USDI Bureau of Land Management. 476 p.

Jackson-Josephine Regional Strategies Board. 1994. Regional strategies strategic plan for1994-95 (Final Document). Medford (OR): Southern Oregon Regional Economic Development Inc. 152p.

Johnson JD, Rasker R. 1995. The role of economic and quality of life values in rural business location. J Rural Stud. 11(4): 405-416.

Johnson NK. 1980. Character variation and evolution of sibling species in the *Empidonax difficilis-flavescens* complex. Univ Calif Publ Zool v112: 1- 151.

Jules ES, Frost EJ, Mills LS, Tallmon DA. 1999. Ecological consequences of forest fragmentation in the Klamath region. Nat Areas J. 19(4): 368-378.

Kagan J, Caicco S. 1996. Manual of Oregon actual vegetation. Version 1.21 Portland (OR) U.S. Fish and Wildlife Service. 195 p.

Keane B, Reinhart E, Brown J. 1995. FOFEM —a first order fire effects model. In: Brown JK, Mutch RW, Spoon CW, Wakimoto RH, tech coords. Proc: symposium on fire in wilderness and park management; 1995 March 30-April 1; Missoula (MT). Ogden (UT): Gen Tech Rep. INT-GTR-320. USDA, Forest Service, Intermountain Research Station. p 214-215.

Kent JA, Preister K. 1999. Methods for the development of human geographic boundaries and their uses. In partial completion of Cooperative Agreement No. 1422-P850-A8-0015 between James Kent Associates (JKA) and U.S. Department of Interior, Bureau of Land Management, Task Order No. 001, June.

King D, Browning R, Schuck M. 1977. Selected Klamath Basin tributary drainages - aquatic habitat inventory and analysis. Unpublished report. Medford (OR): Medford District, Bureau of Land Management. p 40-42.

Larsen LP. 1976. Klamath resource area silvicultural report. Preliminary draft. Medford (OR): Medford District, Bureau of Land Management.130 p.

Laycock WA. 1989. Secondary succession and range condition criteria: Introduction to the problem. In: Lauenroth WK, Laycock WA, editors. Secondary successsion and the evaluation of range condition. Boulder (CO): Westview Press. 163 p.

Laycock WA. 1991. Stable states and thresholds in North American rangelands- a viewpoint. J Range Manage. 44: 427-433.

MacDonald LH, Smart AW, Wissmar, RC. 1991. Monitoring guidelines to evaluate effects of forestry activities on streams in the Pacific Northwest and Alaska. Seattle (WA). U.S. Environmental Protection Agency.

Mack JM. 1996. Archaeological Investigations within the Upper Klamath Drainage: Jenny Creek Watershed. Unpublished Report. Medford (OR): Medford District, Bureau of Land Management. 242 p.

Matton SO, Emmel JF, Emmel TC, 1998. The distribution of *Polites mardon* (Lepidoptera: Hesperiidae) in North America and description of a new subpsecies from Southern Oregon. In: Emmel TC, editor. Systematics of Western North American Butterflies. p 767-774 Gainsville (FL): Mariposa Pr. 878 p.

May M. 1999. Survey of high elevation C/SEEA Wet Meadows. Unpublished Report. Medford (OR): Medford District, Bureau of Land Management.

McCullah J, Manning M, Howard J, Youngblood N. 1998. Schoheim Jeep Trail hydrologic impacts assessment. Unpublished report for Soda Mountain Wilderness Council. Redding (CA): Salix Applied Earthcare. 13 p.

Meffe GK, Carroll CR, and contributors. (1997). Principles of conservation biology. second edition. Sunderland (MA): Sinauer. 600p.

Miller P. 1999. Oregon Gulch Research Natural Area: Plant community associations. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management. 16 p.

Minore D. 1978. The Dead Indian Plateau: a historical summary of forestry observations and research in a severe southwestern Oregon environment. U.S. Department of Agriculture. General technical Report. PNW-72, p. 23.

Naslund H. 1997. The Geology of the Hyatt and Surveyor Mountain Quadrangles, Oregon. [MSc thesis]. Eugene: Univ Oregon.

Nelson K. 1997. Terrestrial vertebrate fauna survey of the Soda Mountain Region of Southwestern Oregon. [MSc Project]. Ashland: Southern Oregon Univ. 88 p.

Noss RF, Copperrider AY. 1994. Saving nature's legacy: protecting and restoring biodiversity. Washington (DC): Island Pr 416p.

Niemi E, Gall M, Johnston A. 1999. An economy in transition: The Klamath-Siskiyou Ecoregion. Prepared for the Klamath-Siskiyou Alliance. Eugene (OR): ECONorthwest. 36p.

Olson M. 1987. Will the North rise again? California's far north keeps the secessionist dream alive. The World, Coos Bay OR. December 6, 1987.

Oregon Department of Environmental Quality. 1988. 1988 Oregon statewide assessment of nonpoint sources of water pollution. Portland (OR): Planning and Monitoring Section, Water Quality Division.

Oregon Department of Environmental Quality. 1992. Oregon administrative rules, Chapter 340, Division 41, Rogue Basin. Portland (OR).

Oregon Department of Environmental Quality. 1997. Guidance for developing water quality management plans that will function as TMDLs for nonpoint sources. Portland (OR): ODEQ

Oregon Department of Environmental Quality. 1998. Oregon's criteria used for listing water-bodies. Oregon Department of Environmental Quality. Portland (OR): ODEQ.

Oregon Department of Fish and Wildlife. 1999. Fish Presence Survey - Upper Bear Creek Watershed. Unpublished maps and forms. Central Point (OR): ODFW. 54 p.

Oregon Department of Fish and Wildlife and Bureau of Land Management. 1997. Aquatic inventory project - physical habitat surveys, Bear Creek basin, Emigrant Creek. Corvallis (OR): ODFW. 29 p.

Oregon Department of Fish and Wildlife. 1997. Aquatic inventory project, physical habitat surveys and fish surveys for Camp Creek. Central Point (OR): ODFW.

Oregon Department of Fish and Wildlife. 1997. Aquatic inventory project, physical habitat surveys and fish surveys for Bear Creek Basin. Central Point (OR): ODFW.

ONHVC (Oregon Natural Heritage Advisory Council). 1998. Oregon Natural Heritage Plan. Salem (OR): State Land Board. 138 p.

Oregon Natural Heritage Program. 1998. Rare, threatened, and endangered plants and animals of Oregon. Portland (OR): Oregon Natural Heritage Program. 92 p.

OWRD (Oregon Water Resources Department). 1997. 1997 Oregon Water Laws, Volume 1: Oregon water laws and water-related statutes. Klamath River Basin Compact, Chapter 542.620. Salem (OR): State of Oregon Water Resources Department.

Orr WN, Orr EL. 1981. Handbook of Oregon Plant and Animal Fossils. Eugene (OR): William N. Orr. 283 p.

Orr WN, Orr EL, Baldwin E. 1992. Geology of Oregon, 4th ed. Dubuque (IA): Kendall/ Hunt. 245p.

Parker M. 1999. Aquatic survey of Oregon Gulch, Skookum, Camp, Dutch Oven, Scotch and Slide Creeks. Unpublished report. Medford (OR): Ashland Resource Area, Medford District, Bureau of Land Management. 12 p.

Pater DE, Bryce SA, Thorson TD, Kagan J, Chapell C, Omernick JM, Azevedo SH, Woods AJ. 1997a. Ecoregions of Western Washington and Oregon. Map and discriptive text. 1 p. Available from: JM Omernick, Corvallis (OR): Environmental Protection Agency.

Pater DE, Bryce SA, Thorson TD, Kagan J, Chapell C, Omernick JM, Azevedo SH, Woods AJ. 1997b. Summary Table: Characteristics of Ecoregions of Western Washington and Oregon. 1 p. Available from: JM Omernick, Corvallis (OR) Environmental Protection Agency.

Peck DL, Griggs AB, Schlicker HG, Wells FG, Dole HM. 1964. Geology of the Central and Northern Cascade Range in Oregon. Geological Survey Professional Paper 449. Washington (DC): U.S. Geological Survey. 56 p.

Pfrender M, Lynch M. 1998. Preliminary assessment of genetic diversity in Klamath basin populations of speckled dace (*Rhinichthys oscularus*). Progress report on ODFW contract #897. Univ Oregon. Eugene, OR. 5 p.

Pickthorn WJ, Goldfarb RJ, Plouff D, Sutley SJ, Wilcox MD, Peters TJ, Willett SL. 1990. Mineral resources of the Soda Mountain Wilderness Study Area, Jackson County, Oregon. Mineral Resources of Wilderness Study Areas: Central and Far Western Oregon. US Geol Surv Bull v1744-C. 8 p.

Prevost ME, Brock R, Ormsby T, Ebersole J.1990. Proposal for the Siskiyou Mountains Natural Area ACEC. Submitted Proposal. Medford (OR): Medford District, Bureau of Land Management. 19 p.

Pieper RD. 1994. Ecological implications of livestock grazing. In: Vavra M, Laycock WA, Pieper RD, editors. Ecological implications of livestock herbivory in the West. Denver (CO): Society for Range Management. 297 p.

Power TM, editor. 1996. Economic Well-Being and Environmental Protection in the Pacific Northwest: A Consensus Statement by Pacific Northwest Economists. Missoula (MT): Univ Montana. January, 1996.

Preister K.1999. Making connections: Research and action planning for economic development in the Illinois River Valley. Cave Junction (OR): Illinois Valley Community Response Team.

Pullen R.1996. Overview of the environment of native inhabitants of southwest Oregon, late prehistoric era. Unpublished Report. USDA, Rogue River, Siskiyou, Umpqua National Forests; USDI, Medford District, BLM.

Purdom, W. [n. d.] Pilot Rock Geology. Ashland (OR): Siskiyou Naturalist. 1 p.

Rambo JL, Faeth SH. 1999. Effect of vertebrate grazing on plant and insect community structure. Conserv Biol 13: 1047-1054.

Reid R, Flagg WR. 1995. An economic assessment of Jackson and Josephine Counties. For Southern Oregon Regional Economic Development, Inc. Ashland (OR): Southern Oregon Regional Services Institute, Southern Oregon Univ. 49 p.

Reid R, Lucas CS. 1997a. Update to an economic assessment of Jackson and Josephine Counties, 1996-1997. For Southern Oregon Regional Economic Development, Inc. Ashland (OR): Southern Oregon Regional Services Institute, Southern Oregon Univ. 24 p.

Reid R, Lucas CS. 1997b. Profile of summer visitors to Jackson and Josephine Counties, Oregon: A comparison of interview survey data, 1990 and 1996. For Southern Oregon Regional Economic Development, Inc. Ashland (OR): Southern Oregon Regional Services Institute, Southern Oregon Univ. 41 p.

Reid R, Lucas CS. 1997c. Profiles of Jackson and Josephine Counties' motel visitors, summer and off-season, 1996-1997. For Southern Oregon Regional Economic Development, Inc. Ashland (OR): Southern Oregon Regional Services Institute, Southern Oregon Univ. 31 p.

Rosgen D. 1996. Applied river morphology. Minneapolis (MN): Media Companies. 356 p.

RVCOG (Rogue Valley Council of Governments). 1997. Staff Report, Jackson County Planning and Development Services, Unincorporated Community, Lincoln-Pinehurst. File No: 97-7-CPA & 97-9-OA.

Rossa JM. 1999. The importance of fish size, environmental variables, and year to jenny creek sucker summer habitat use at two different spatial scales. [MSc Thesis]. Logan: Utah State Univ. 96 p.

Runquist E. 1990. Soda Mountain butterfly field trip. Unpublished species list. Medford (OR): Medford District, Bureau of Land Management.

Runquist E. 1999. Butterfly community surveys in the soda mountain region, Jackson County, Oregon. Unpublished report. Medford (OR): Medford District, Bureau of Land Management. 27 p.

St. John AD. 1984. The herpetology of Jackson and Josephine Counties, Oregon. Technical Report #84-2-05, Oregon Department of Fish and Wildlife, Nongame Wildlife Program.78 p.

Sawyer J, Keeler-Wolf T. 1995. A manual of California vegetation. Sacramento (CA): Calif Native Plant Soc. 471 p.

Schmidt RG, Rinehart GC. 1982. Line production estimating guides for fire behavior fuel models. Fire Management Notes. Summer: 6-9.

Silva R. 1999. A timeline of the early trails to Siskiyou and "Bonaventura" and Oregon/California trail maps and artifacts from the west C/SEEA region. Unpublished Report. Medford (OR): Medford District, Bureau of Land Management. 11 p. Tables and Maps.

Smith JG, Page J, Johnson MG, Moring BC, Gray F. 1982. Preliminary geological map of the Medford 1° X 2° Quadrangle, Oregon and California. Washington (DC): USDI, US Geol Sur. 1 sheet.

Southworth D, Seevers J. 1997. Taxonomic Status of *Limnanthes floccosa* spp. *bellingeriana* (Limnathaceae). In: Kaye T and others, editors. Conservation and management of native plants and fungi. Corvallis (OR): Native Plant Soc Oregon. p 147-152.

Snepenger DJ, . Johnson JD, Rasker R. 1995. Travel-stimulated entrepreneurial migration. J Travel Research. 34(1): 40-44.

Squyres Dave. 1995. Calculations of hydrologic flows, Jenny Creek. Medford (OR): Medford District, Bureau of Land Management.

Steimle E. 1999. Schoheim Road starthistle survey. Unpublished Report. Medford (OR): Medford District, Bureau of Land Management.

Thomas TL, Agee JK. 1986. Prescribed fire effects on mixed conifer forest structure at Crater Lake, Oregon. Can J Forestry Res. 16(5): 1082-1086.

Thompson J, Drewien W. 1983. Soil-Vegetation Interpretation of SW Cascades, Jackson County, Oregon. Unpublished report. Medford (OR): Medford District, Bureau of Land Management.

Todt D. 1997. Schoolhouse Meadow Plant List. Field Notes 06/21.

Trail P, Sherlock L. 1998. Comments on the Box O Ranch Proposed Management Plan and Environmental Assessment. Submitted comments on behalf of Rogue Valley Audubon Society et al. Medford (OR): Medford District, Bureau of Land Management.

Trail P. 1999a. Birds of the Soda Mountain Region, Oregon and California. Unpublished bird list. Medford (OR): Rogue Valley Audubon Society. 3 p.

Trail P. 1999b. Draft: Jenny Creek and "Upper Klamath Lake Headwaters" populations of Oregon Basin Redband Trout. Unpublished manuscript. Medford (OR): District, Bureau of Land Management. 6 p.

USDA Natural Resources Conservation Service. 1999. Soil Biology Primer. PA-1637

USDA Soil Conservation Service. 1993. Soil Survey of Jackson County Area, Oregon.

USDA Forest Service - USDI Bureau of Land Management. 1994a. Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl.

USDA Forest Service - USDI Bureau of Land Management. 1994b. Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl.

USDI Bureau of Land Management. n.d. "Analysis of Alternative Grazing Management in Klamath Falls Resource Area" in the Draft Klamath Falls Resource Management Plan/DEIS. Klamath Falls (OR): Klamath Falls Resource Area, Lakeview District, Bureau of Land Management.

USDI Bureau of Land Management. 1983. Medford Grazing Management Program/Draft Environmental Impact Statement. Medford (OR): Medford District Office. 24 p.

USDI Bureau of Land Management. 1986. Northwest area noxious weed control EIS. Portland (OR): Oregon State Office, Bureau of Land Management.

USDI Bureau of Land Management. 1987. 1623 - Supplemental Program Guidance for Land Resources. Portland (O): Oregon State Office, Bureau of Land Mangement.

USDI Bureau of Land Management. 1988. Area of Critical Environmental Concern (ACEC) staff suggestion for Pilot Rock.. Medford (OR): Medford District Office Bureau of land Management.

USDI Bureau of Land Management. 1989a. Area of Critical Environmental Concern (ACEC) Public Nomination for Jenny Creek. Medford (OR): Medford District Office Bureau of land Management.

USDI Bureau of Land Management. 1989b. Final EIS for the control of competing vegetation in Western Oregon. Portland (OR): Oregon State Office, Bureau of Land Management.

USDI Bureau of Land Management. 1989c. Area of Critical Environmental Concern Nomination for Oregon Gulch Research Natural Area. Medford (OR): Medford District, Bureau of Land Management.

USDI Bureau of Land Management. 1990a. Source Book for Natural Area Coordinators: A Guide for Developing Natural Area Management and Monitoring Plans. Portland (OR): Oregon State Office, Bureau of Land Management. p 11-29

USDI Bureau of Land Management. 1993. Redding Resource Management Plan and Record of Decision. Redding (CA): Redding Resource Area, Bureau of Land Management.

USDI Bureau of Land Management. 1994. Final Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl. Appendix J2. Results of Additional Species Analysis. 476 p.

USDI Bureau of Land Management. 1995a. Medford District Record of Decision and Resource Management Plan. Medford (OR): Medford District, Bureau of Land Management.

USDI Bureau of Land Management. 1995b. Jenny Creek Watershed Assessment and Analysis. Medford (OR): Medford District, Bureau of Land Management.

USDI Bureau of Land Management. 1997. Standards for Rangeland Health and Guidelines for Livestock Grazing Management for Public Lands Administered by the Bureau of Land Management in the States of Oregon and Washington.

USDI Bureau of Land Management. 1998. Recreation Area Management Plan: Pacific Crest National Scenic Trail Special Recreation Management Area. Medford (OR): US Dept of Interior. Bureau of Land Management. 25 p.

USDI Bureau of Land Management. 1999. Jenny Creek Late-Successional Reserve Assessment. Medford (OR): Medford District, Bureau of Land Management.

USDI Bureau of Land Management. 2000a. Klamath-Iron Gate Watershed Analysis. Medford (OR): Medford District, Bureau of Land Management.

USDI Bureau of Land Management.2000b. Upper Bear Creek Area Watershed Analysis. Medford (OR): Medford District, Bureau of Land Management.

USDI Fish and Wildlife Service. 1988. Endangered Species Act of 1973, As Amended through the 100th Congress.

USDI. 1984. Taylor Grazing Act in Oregon 1934-1984, 50th Anniversary.

Volpe C, Estes P. 1999. Field notes for presence and absence surveys of fish in East Fork Cottonwood Creek. Medford: Oregon Department of Fish and Wildlife.

Whorton M, Sohocki D. 1996. Fairness matters: An introduction to environmental justice. Denver, Colorado: Environmental Innovations.

Wiitala MR. 1992. Aviation and Fire Management, "PROBACRE: A Model for Computing Aggregate Burned Acreage Probabilities for Wildfire Risk Analysis. USDA Forest Service, Pacific Northwest Region.

Wisseman B. 1991. Benthic invertebrate biomonitoring: Lower Jenny Creek site, Jenny Springs Creek site, and Keene Creek site. Report. Medford (OR): Medford District, Bureau of Land Management. 20 p.

Wisseman B. 1992. Benthic invertebrate biomonitoring: Upper Jenny Creek site. Report. Medford (OR): Medford District, Bureau of Land Management. 21 p.

Wisseman B. 1993. Benthic invertebrate biomonitoring: Keene Creek site and Dutch Oven Creek site. Report. Medford (OR): Medford District, Bureau of Land Management. 39 p.

Wisseman B. 1994. Benthic invertebrate biomonitoring: Soda Creek site. Report. Medford (OR): Medford District, Bureau of Land Management. Medford, OR. 19 p.

Wisseman B. 1995. Benthic invertebrate biomonitoring: Lower Jenny Creek sites and Jenny Springs Creek site. Medford (OR): Medford District, Bureau of Land Management. 60 p.

WorldClimate 1999. Precipitation and temperatures for selected CSEEA weather stations. Internet. [http://www.worldclimate.com]

World Wildlife Fund. 1998. Global 200: Focal 25 Factsheet: Klamath-Siskiyou Forests. [http:www.wwf.org/action/global200/new/25_ksf.htm].

Wright GF. 1954. Local history notes, compiled by George Wright during the 1950's. Copy on file. Medford (OR): Medford District, Bureau of Land Management.

Index

Access: 105, 148, 267
Acquired lands: 218
Affected Environment: 13
Agriculture: 100, 282, 287
Air Quality: 215
Alien aquatic plants: 130
Alien plants: 118, 126, 140
Alien terrestrial plants: 130
Alternative A (No Action): iv, 174, 211
Alternative B: iv, 180, 212
Alternative C: iv, 185, 212
Alternative D: iv, 194, 212
Alternative E: v, 204
Alternatives Considered but Eliminated from Analysis: 219
Amphibians: 35, 39, 41, 77, 120, 127, 131, 142
Analysis Assumptions and Guidelines: xix, 223
Animals: 119, 126, 131, 141
Animal influences: 64
Aquatic animals: 130
Aquatic Conservation Strategy Objectives: 152, 218
Aquatic insects: 35, 120
Aquatic resources: 31, 32, 38, 40, 44, 234
Aquatic vegetation: 152
Aquatic wildlife: 153
Archaeological sites: 19, 215
Area of Critical Environmental Concern: 268
Authorized uses: 89, 217
Bats: 141
Bear Creek Watershed: 38
Biological diversity: 158
Birds: 70, 120, 127, 141, 246
Bottomland pasture: 164
Boundaries: 174, 180, 185, 195, 204, 211, 234
Box-O Ranch: 147, 219
Butterflies: 141
Chaparral types: 115
Climate: 148
Coarse woody debris: 23
Community interests: 95
Conifer communities: 47
Conifer forest disturbance agents: 62
Cottonwood Creek Watershed: 43
Crustaceans: 35
Cultural resources: 16, 165, 224
Cumulative impacts: 268
Current stand conditions: 105
Dissolved oxygen: 29
Distribution List and Availability: 297
Ecological interactions: 53
Ecological processes: 13, 224
Economics: 97, 98
Ecosystem health: 158
Environmental Consequences: xix, 223
Environmental justice: 103
Facilities: 145, 166, 176, 181, 191, 198, 207
Fencing: 165
Fire: 6, 215, 262, 294
Fire hazard: 68
Fire history: 157
Fire risk: 63
Fire suppression: 69, 215
Fish: 32, 40, 120, 127, 131, 142, 153, 218
Forest health: 61, 126, 175, 181, 190, 198, 206, 237, 257
Forest insects and disease: 62
Fragmentation: 6, 293
Fuels: 65
Garry oak woodland: 113
Geology: 20, 111, 122, 129, 134, 146
Glossary: 303
Grasslands: 46, 114, 139, 175, 181, 191, 198, 206, 238, 249
Grazing: 5, 121, 128, 142, 174, 180, 185, 196, 205, 219, 235, 292
Harvest systems: 105
High-severity regime: 66
Hiking and non-motorized recreation: 6, 175, 181, 190, 197, 205,
    237, 274, 295
Historic use: 16
Horse/Pack stock recreation: 176, 181, 191, 198, 207, 239, 274
Hydrology: 24, 111, 123, 131, 136
Insects: 127
Introduced plants: 58, 251
Introduced and exotic fish: 34
Irrigation system: 163, 219
Issues: iii, 5, 7, 292
Jenny Creek Area of Critical Environmental Concern: 128
Jenny Creek Watershed: 31
Klamath-Iron Gate Watershed: 40
Lake fisheries: 36
Land ownership: 13
Landscape criteria: 14
Landscape health: 13, 224
Land use allocations: 276
Late-successional reserve: 107
List of Preparers: 301
Livestock forage: 162
Livestock grazing: 84, 164, 267
Livestock handling: 165
Livestock management (grazing): 146, 265
Low-severity regime: 66
Macroinvertebrates: 39, 42
Mammals: 78, 142, 248
Management Common to All Alternative: v, 7, 213
Management strategies: 8
Matrix: 104
Minerals: 88, 146, 155, 176, 181, 191, 198, 207, 239
Mining: 6, 293
Mitigation opportunities: 285
Moderate-severity regime: 66
Mollusks: 35, 120, 127
Noxious weeds: 59, 165, 214, 251
Oregon Gulch Research Natural Area: 121
Off-Highway vehicle: 175, 181, 190, 197, 205, 236, 270
Pacific Crest National Scenic Trail: 7, 144, 218, 295
Pathogens:30
Pilot Rock: 142
Pilot Rock Area of Critical Environmental Concern:132
Planning criteria: 8, 9

Planning process: 4, 10
Plant communities: 45, 51, 155
Planning consistency: 295
Prescribed fire: 69, 219, 264
Private land acquisitions: 176, 181, 191, 198, 206, 238
Purpose and Need: 3
Rangeland improvements: 267
Ranch buildings: 166
Recreation: 88, 101, 121, 128, 132, 144, 147, 165, 216, 219, 267, 270, 275, 284, 287
References: 315
Reptiles: 35, 39, 77, 247
Research Natural Area: 268
Rights-of-way: 176, 191, 198, 207
Riparian community types: 113
Riparian habitat: 31, 38, 40, 43, 44, 234
Riparian vegetation: 49, 152
Roads: 5, 292
Rock outcrops: 114
Scoping Process: 5, 291
Scotch Creek Research Natural Area: 110
Sedimentation: 30
Shrublands: 46, 175, 181, 191, 198, 206, 238, 249
Snowmobile use: 273
Social and economic: 90, 96, 102, 167, 276
Social institutions: 94
Soda Mountain Wilderness Study Area: 145, 214, 219
Soils: 22, 111, 123, 129, 135, 154, 227
Soil health:23
Special emphasis species: 79
Special forest products: 105, 176, 181, 191, 198, 206, 239
Special interest species: 248
Special national designation: 213
Special plants: 119, 126, 140
Special plant communities: 49
Special status species: 70, 161, 218
Special status plants: 55, 157, 249
Spotted owl habitat: 106
Stream channels: 31, 37, 39, 42, 44, 148, 23
Stream fisheries: 37
Survey & manage plant species: 56
Terrestrial insects:120
Terrestrial mollusk: 79, 248
Terrestrial wildlife: 70
Timber: 98, 105, 109, 174, 180, 189, 196, 205, 235, 283
Timber harvest: 6, 64, 259, 293
Topography: 110, 122, 133
Tourism: 101
Transportation: 82, 121, 128, 132, 142, 166, 174, 180, 185, 196, 205, 236, 264
Unique natural and biological values: 6, 294, 294
Vegetation: 45, 112, 124, 129, 138, 145, 249
Water bacteria: 30W
Water rights: 163
Water quantity: 150
Water quality: 27, 151, 232
Water temperature: 27
Water turbidity: 30
Wild horses: 87, 162
Wildlife: 70, 131, 146, 159, 161, 218, 239
Wildfire history: 65
Wildfire suppression: 262
Winds: 64
Woodlands: 47, 175, 198, 206, 238, 249

☆ U.S. GOVERNMENT PRINTING OFFICE: 2000 — [illegible] Region No. 10

END

06-28-00